# A Report on the
# Scientific Work of the Surgical Staff
### of the
# Women's Hospital
### of the
# State of New York
# 1918

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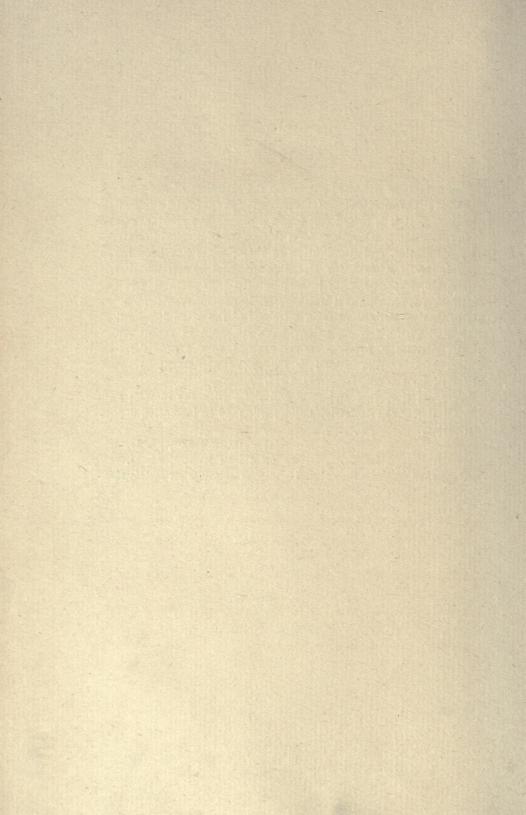
Edited by HERMANN GRAD, M. D.

NEW YORK
1918

# FOREWORD

The volume of collected papers by the members of the Surgical Board of the Woman's Hospital is presented as the initial publication of others that it is hoped will follow and present a constant record of the scientific contributions from this source in medical literature. The publication and distribution of this volume has been made possible by the generous donation of Mrs. Frederick Ferris Thompson, whose constant interest in all things pertaining to the Hospital is as untiring as it is sincere. The papers herewith included are original contributions from members of the attending surgical staff, and with a few exceptions, have appeared in recent issues of the AMERICAN JOURNAL OF OBSTETRICS, to the publishers of which, Messrs. Wm. Wood & Co., acknowledgment is made herewith for the courtesies extended.

We trust that this endeavor will meet with the interest and appreciation of the profession and all who may be interested in this institution.

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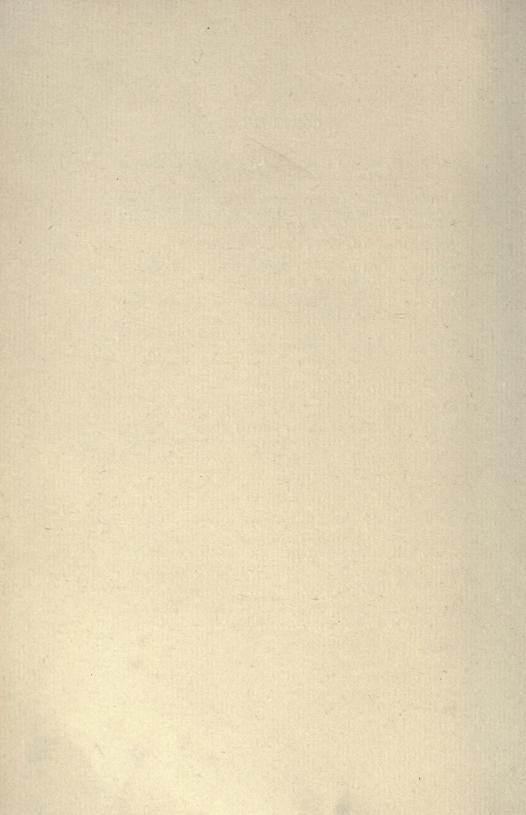
HERMANN GRAD, M. D.
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*Committee on Publication.*

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**Assistant Superintendent.**

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**Directress of Nurses.**

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# THE WOMAN'S HOSPITAL IN THE STATE OF NEW YORK. FOUNDED IN 1855.

### AN HISTORICAL SKETCH.

BY

### J. RIDDLE GOFFE, A. M., M. D.,

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New York, N. Y.

THE WOMAN'S HOSPITAL has the distinction of being the first institution of its kind in the world founded by women for the exclusive use of women. This refers to the financial foundation and the attendant personal supervision that characterized its management during its infancy, and has continued from that time when Mrs. Doremus, she of fond and illustrious memory, went daily out of her home before breakfast and purchased the hospital supplies. As has been said "Heeding neither day nor night, nor storm nor sunshine, nor height nor depth, they stayed neither hand nor foot," until the object was accomplished in the establishment of the hospital and its development to its present standing and importance.

It must not be forgotten, however, that the hospital had its inception in the inspiration and genius of one man, Dr. J. Marion Sims. In the words of Dr. D. B. St. John Roosa, "In this Woman's Hospital there is the everlasting sign and signature of an epoch-making discovery by an American whose name will be known as long as the English language shall be spoken—as long as grass grows and water runs—J. Marion Sims." As Marion Sims is recognized as the father of gynecology, so may the Woman's Hospital in the State of New York be fittingly termed its birthplace.

Although the hospital was established primarily for the relief of a certain condition—vesicovaginal fistula—it early became the seat of instruction in gynecology for the medical profession, not only of America, but of the entire world. All the lesions of childbirth and their complications were here incidentally presented for observation and study; various operations were invented for their relief and were standardized. The hospital thereby became the foremost influence throughout the world in developing and establishing the great surgical specialty of gynecology. This is conspicuously demonstrated in the fact that the impulse given by the Woman's Hospital encouraged the general hospitals and dispensaries everywhere to

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establish separate gynecological services and the medical schools to found professorships of gynecology. Among the first physicians to fill chairs of gynecology in this country were surgeons of the Woman's Hospital, viz.: Dr. T. Gaillard Thomas at the College of Physicians and Surgeons, Columbia University, and Dr. C. Randolph Peaslee at Dartmouth College.

The early history of the hospital reads like a romance, although punctuated by many tragic moments. At that time the obstetrical forceps were practically unknown, at least were not in general use. Therefore in many instances a woman was obliged to deliver herself after long and difficult labor. In these cases the child's head became jammed in the pelvis, with the bladder pressed against the symphysis for sufficiently prolonged periods to cause necrosis of the base of the bladder, attended later with sloughing of the tissues and the production of a vesicovaginal fistula, causing a constant leakage of the urine. Every community had within its borders one or more of these pitiable cases, the patient being practically excluded, not only from society at large, but in many instances, from her immediate family—a sad and pitiable lot.

Efforts had been made by surgeons everywhere to relieve this condition but with discouraging results. No operation, based on surgical principles, had been devised which could be trusted to prove successful. Dr. J. Marion Sims, of Montgomery, Alabama, undertook the investigation of this pathological condition and its relief. Filled with enthusiasm and feeling sure of success, be built a private hospital, collected all the cases he could find in the country round about him (mostly negro slaves), kept them at his own expense, and began a regular series of scientific experiments, founded on physiological and pathological laws. His operations failed; he was disappointed but not disheartened. He toiled nearly four years (expending a large portion of his private means) before a single case was cured. He operated upward of forty times on three patients and twenty-one times on one of them, during these experiments. One obstacle, and then another, and another, was gradually overcome, when the first great operation was finally perfected in March, 1849. He brought the operation to such a degree of perfection as well as the instruments which he invented, that it still remains to-day an ideal procedure. But constant mental tension, great responsibility, and daily toil, had now undermined his health, and he was obliged to seek change of climate and a higher latitude. Hence his location in New York.

Before coming to this city he had published his great discovery to

the world in the *American Journal of the Medical Sciences*, illustrated with all the wood-cuts necessary to make it clearly understood and a report of six successful cases. Of no mean reputation as a surgeon before, this established his chirurgical power, and, as a consequence, he was warmly welcomed to New York by the whole medical profession. Our illustrious Mott was the first to recognize him and the eminent Stevens the foremost to suggest to him the propriety of laying his views before the medical profession of this city on the necessity of organizing a Woman's Hospital. This plan was adopted, and on the memorable 18th of May, 1854, in the Stuyvesant Institute, Dr. Sims delivered an elaborate and lucid lecture on the novel and important principles involved in the cure of vesicovaginal fistula. The profession then and there took the matter into their own hands and appointed a committee of organization.

With the endorsement of the whole profession and under the special direction of this committee, Dr. Sims was sent to the prominent women of New York as an emissary to plead the cause of woman. "He visited the wives and mothers of New York City. He laid the sorrows of suffering woman before them; they heard, they sympathized, they spoke, and lo! the Woman's Hospital sprang into existence."

On the 10th of February, 1855, some thirty New York ladies met in a quiet parlor in St. Mark's Place, there to listen to a proposal and accept a constitution calling into being a new charitable institution to be known as the Woman's Hospital, and its organizers as the Woman's Hospital Association. Organization and incorporation soon followed.

A house was rented at the corner of Madison Avenue and 29th Street and modestly fitted up. On the 4th of May, 1855, the hospital was opened, having J. Marion Sims, Resident Surgeon, with the following consulting board. Consulting Surgeons: Alexander H. Stevens, M. D., Valentine Mott, M. D.; Consulting Physicians: Edward W. Delafield, M. D., John W. Francis, M. D., Horace Green, M. D. Two "matrons" one to attend to the domestic concerns and the other to administer under the surgeon's orders to the sick, and a nurse completed the officers of the hospital.

The hospital contained forty beds, was comfortably furnished throughout and everything necessary or desirable, as understood in those days, was liberally provided. To the poor the beds in the wards and all that the hospital offered were free. Those occupying separate rooms were charged varying amounts, according to the size and location of the room.

The Woman's Hospital has never professed as its first aim to be an unrestricted charity but rather a well-directed benevolence, although the element of pure charity is by no means omitted. In pursuing its even course of benevolence it has sought to provide accommodations for all classes, the extremely poor, the educated and refined without means to command luxuries but whose sense of justice insisted upon moderate payment, and finally for the most fastidious and wealthy. No woman need fail of opportunity for relief.

Patients came in constantly increasing numbers from all parts of the country and the success attending the surgical work was most surprising. "The early days of the hospital were like the days of miracles, when woman came with her infirmity and was healed."

At the first anniversary meeting held February 9, 1856, less than one year after the opening of the hospital, the Executive Committee was able to report that sixty patients had been received, twenty-one of whom had been discharged perfectly cured, and that all the patients still remaining in the hospital (with one exception) were pronounced by the resident surgeon curable. Nor was this all, for the outdoor patients had exceeded in number the inmates and had been prepared by treatment for the operations to follow.

Through many trials, tribulations and financial discouragements the hospital was continued through the Civil War. A block of land bounded by Park and Lexington Avenues and 49th and 50th Streets was donated by the city, and a building was constructed and opened for patients October 12, 1867. It had accommodations for seventy-five patients, nurses, resident house staff, operating room, superintendent and administration officers. On September 17, 1877, a second building similar to the first was completed and opened for patients. These increased accommodations and improved facilities afforded more ample and satisfactory scope for surgical work and investigation. And here the work of the hospital was continued till 1902, when the property was sold and the hospital temporarily closed. The new building now occupied was opened for patients December 5, 1906, after an interregnum of four years.

### THE HOSPITAL AS A TEACHING INSTITUTION.

The primary motive of the prominent medical men of New York in rallying to the establishment of the Woman's Hospital was to afford an opportunity to Dr. Sims to teach the profession how to perform his operation. Underlying this, of course, was the ultimate object of thereby extending as widely as possible the application of

the operation for the relief of suffering woman.   Dr. Sims and Dr. Emmet were in cordial sympathy with this idea and afforded, from the first, every opportunity to the profession to witness their work. At the laying of the cornerstone of the first hospital pavilion Mr. James W. Beekman, President of the Board of Governors, said: "To practise and to teach this surgical discovery, the cure of vesico-vaginal fistula—is the object of our hospital."   Indeed in the Acts of Incorporation, Section IX, we find: "All the professors and matriculated students of any regular medical college in the State, and all other members of the medical profession and students of medicine may be admitted to the privilege of visiting said hospital under such equal regulations as may be prescribed by the Board of Governors.   The primary object of the hospital is the direct relief of suffering humanity; the second object is the extension of this relief to the widest possible degree by using it as a school of practical instruction of the medical profession."

As rapidly as space could be provided the surgeons from far and near crowded in from three to four hundred per year, to witness the operations.   The attending surgeons have consistently adhered to this practice of welcoming members of the profession to the hospital and affording opportunity for scrutinizing its work in every department. In the operating rooms the perfecting of the techinic of supravaginal hysterectomy, the repair of the pelvic floor, and kidney surgery have been objects of united effort on the part of the staff.   The study of the causative factors involved in procidentia, cystocele and rectocele and the more recent operations presented for relief have been subjects of careful investigation and original operative procedures. To stimulate team work, a combination of pathological and clinical conferences has been organized.   The work of the laboratory and the operating room is thus coördinated and made reciprocally valuable.   Interesting and instructive cases are brought in from the wards of the hospital.   At a recent meeting the surprisingly satisfactory results of the Carrel-Dakin treatment of infected wounds was demonstrated in a case of infected wound of the abdominal wall following operation.

These conferences are held every Thursday at 4 P. M. in the lecture room of the pathological laboratory and are attended by all the surgical staff of the hospital.   Members of the profession are cordially welcomed.

It may be asked what concrete things have the surgeons of the Woman's Hospital contributed to the Science and Art of Surgery. The men who laid the foundation of the Woman's Hospital and

established its fame were pioneers in a field of discovery where unexplored problems of pathology had to be solved, maps drawn to prevent losing the way and tools invented with which to do the work.

Sims was the genius, the man of vision, of undaunted courage and determination and overflowing with inspiration.   He had the quality of mind that brushed aside detail and led at once to the crucial point of the problem at hand.   While circumstances led him to devote his life work to a specialty, his vision embraced the entire field of surgery.   As early as 1847 he wrote his original observations on *trismus nascentium*.   The first child with this trouble to which he was called died and with true scientific instinct he insisted upon and held a postmortem.   He found the cranial bones overlapping, and making mechanical pressure on the brain and a clot of blood due to extravasation between the spinal cord and its membranes.

On his own initiative without knowledge of previous invasion of the field by any operator, he performed the operation of cholecysto-tomy successfully, reported it and advocated the procedure.   Later it developed that he had been preceded in this by Dr. Robb of Indiana by a few months.   He was the foremost man in the world to advocate in the face of the opposition of the greatest general surgeons of Europe and America, the prompt opening of the ab-dominal cavity for gunshot wounds of the abdomen.   This is of historic interest as it occurred in the conduct of the case of our lamented President Garfield.

Under such a leader all the problems attending the lesions of childbirth and the disease of the female generative organs were studied *ab initio* and methods of cure devised.   Sims' undying fame will undoubtedly rest upon his great original work in the field of vesico- and rectovaginal fistula and the founding and establishing of the Woman's Hospital, the birthplace of surgical gynecology.

DR. THOMAS ADDIS EMMET was early associated with Sims as his faithful student and coadjutor.   Later he became an original investi-gator and contributed to the advancement of the specialty.   Dr. Emmet was the first to recognize in all its contorted manifestations of infected tissue, the lesion known as lacerated cervix uteri.   He devised ways and means of reducing these deformities to recognizable traumatic lesions and originated and perfected an operation for restoration to normal form and condition.   He first conceived and devised the hot-water treatment of pelvic congestions and inflam-mations and elaborated the scheme of application that is now used throughout the world.   What woman is there in the civilized world

that does not have her douche bag conveniently hanging behind the bathroom door?  In connection with this was the application of the medicated vaginal tampon—a universal treatment for certain conditions.  The repair of the lacerated pelvic floor as a recognized important or imperative procedure was first suggested by Emmet and an operation devised to meet the infirmity.  Dr. Emmet was a patient, painstaking operator with emphasis on the minutest detail.  His special field was plastic surgery.

Dr. Emmet's book, "The Principles and Practice of Gynecology" was awaited with great interest and hailed throughout the surgical world as the dawn of a new day.

Dr. T. Gaillard Thomas was first after Sims to bring the Woman's Hospital into prominence by his brilliant lectures and his fascinating text-book on "Diseases of Women" which was one of the first to appear in this field and was promptly translated into the French, Spanish and Italian languages.  Dr. Thomas was a bold, brilliant, rather dramatic operator, who revived and did much to establish and popularize ovariotomy and the surgery of ovarian tumors.  This preceded the septic theory of disease and characterized the period when the surgeon washed his hands after operating rather than before.  The death rate was appalling, but he boldly attacked every case with the conviction that if three were saved out of every four it was better than that all should perish wretchedly.  With the introduction of asepsis his experience thus acquired brought his percentage of recovery near to 100 per cent.

Dr. Edmond Randolph Peasley was a contemporary of Dr. Thomas and worked assiduously along the same lines.  He elaborated the idea of drainage and irrigation in laparotomy cases.  He devised a most ingenious apparatus for drainage by gravity, by syphon, and tubes for irrigation by syringe.  His results were not encouraging but he wrote and published the best treaties on ovariotomy that up to that time had appeared.  Dr. Peasley presented an interesting investigation into the life-prolonging results of ovariotomy.  Basing his computation on a series of one hundred ovariotomy patients reported by Spencer Wells and, estimating the average expectation of life of a normal woman at the age of thirty-nine years with an ovarian tumor, as four years (without operation), the operation must have added to them 420 years of life.  By a similar calculation it may be shown that in the United States and Great Britain alone ovariotomy has within the last thirty years (1892) directly contributed more than 30,000 years of active life to woman; all of which would have been lost had ovariotomy not been per-

formed.    Hence he claimed that "ovariotomy in spite of a 20 per cent. death rate is the only appropriate remedy in not less than 80 per cent., *i.e.*, large thin-walled unilocular cysts, of all cases of ovarian tumor."    That was in 1892.    Now, of course, it is recognized as the only treatment in all cases.

Dr. Emil Noeggarath brought great distinction to the hospital in his discovery of the latent influence and effect of gonorrheal infection.    While it was not announced to the profession and the world till after his resignation from the surgical board, it was during his term of service at the Woman's Hospital that his observations were made.    These led to the martialing of facts which brought to him the concept and final conviction.

That the original illuminative work of the Woman's Hospital was far-reaching in its influence and cordially recognized beyond the limits of our own country, is evident from the opinions of our confréres across the water.    The eminent Professor Kleinwächter in his contribution to Müller's encyclopedic work on Obstetrics remarks: "In the specialty of gynecology, North America strives for primacy."    "There within a short time gynecology has risen to an astonishing height, especially in an operative direction.    Beginning with the year 1870 Germany within a few years redeemed her neglect.    The stimulus was in great part derived from the work of Sims, 'Clinical Notes on Uterine Surgery,' which first made Germany familiar with American gynecology."*

Fritsch, the distinguished professor at Breslau says: "The idea of this instrument," speaking of the Sims' speculum, "originates with Marion Sims, who may be called the creator of the new gynecology.    Guided by a principle he was the first to make gynecology surgical and it is the maintenance of this direction that has obtained for gynecology its modern triumphs."

Professor Breisky, the German translator of Emmet's work, "The Principles and Practice of Gynecology" remarks in his preface, "Emmet's name shines as the representative of the surgical school. It is essentially personal, individual, growing out of his own experience and represents therefore more than any similar work, the specific American school."

The French authority, Pozzi says: "To the first enthusiasm excited by the publications of Jobert, there succeeded in Europe complete discouragement, when at the end of 1858, a young American surgeon, Bozeman, of Montgomery, Alabama, came to Paris and

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* For this and the following extracts upon this subject I am indebted to an anniversary address by Dr. Geo. B. Harrison.

made known the modified procedure of his teacher, J. Marion Sims of New York.   The ardor of the French surgeons, Follin and Verneuil, popularized the American method."

Hart and Barbour in their "Manual of Gynecology" remark: "The recognition of laceration of the cervix as a distinct and important lesion, with the operation introduced for its cure, is one of the many gynecological advances of the last twenty years.   For this we are indebted to the genius of Dr. Emmet of New York."

These were the pioneers—the giants of early days.   Many worthy successors have followed in their footsteps, men of no mean surgical ability and possessed of original inventive genius, whose work will stand the test of time and be attested by later writers.

### THE PATHOLOGICAL DEPARTMENT.

In the early days the pathologist was usually the professor of pathology in one of the New York medical schools, and his visits to the hospital were made only when an autopsy was to be performed. The surgical material was collected from the operations and saved for these visits.   The hospital was very fortunate in having for six years the services of Dr. Wm. H. Welsh, at present Professor of Pathology, Johns Hopkins University.   His painstaking autopsies and careful instruction of the house staff in pathological examinations and findings added greatly to the interest and value of the hospital work.   Later under Doctor Jessup's administration an effort was made to save all pathological material, subject it to careful thorough examination and record the reports on the history charts. The examinations were made at the Roosevelt Hospital Laboratory.

In 1915, the laboratory was accorded more fitting recognition. Appropriate floor space was assigned and the rooms supplied with efficient laboratory equipment.   Dr. Lawrence W. Strong was appointed Director of the Pathological Department, with membership on the Surgical Board, and Dr. Emil Schwartz Assistant Pathologist.

In November, 1915, the department moved into the present Thompson Pathological Laboratories.   These consist of two floors of the Thompson Pavilion.   The first floor has rooms for clinical pathology, bacteriology, serology and photography, a preparation and stock room, also a museum and a conference hall.   The floor above has the histological pathology room, a library and offices for the director and the assistant pathologist.   The arrangement and equipment of these laboratories embody the best up-to-date ideas of the most modern laboratory with an eye to time-saving efficiency and accuracy of work.

In 1916, the department inaugurated pathological conferences, held every Saturday morning, open to the medical public. At these conferences the material received during the week is demonstrated. The department also issued in this year an entire number of the Hospital Bulletin with report of cases, description of special technic and development of the laboratory. Courses in gynecological pathology are given to properly accredited applicants according to their special needs.

In 1917, clinical conferences were inaugurated to precede the weekly pathological conferences. These are held by the members of the Surgical Staff. The conference hall has been equipped for stereoptican demonstrations and it is now possible to have patients brought from the hospital wards directly into the conference hall.

The most recent change in the department has been the employment of women as technical assistants, both in the histological department and in the clinical pathological laboratory.

### ANESTHESIA.

The anesthetic department of the hospital as organized at the present time is a gradual evolution from the old-time method in vogue when the junior internes administered all the anesthetics— a slipshod and dangerous system. About ten years ago several of the internes, who were graduating from the hospital and desired to locate in New York, were induced to make a study of anesthetics and become experts in its administration. Three of them were placed on a nominal salary and assigned alternate days of the week, which they devoted to giving anesthesia at the hospital. By mutual understanding they were enabled to substitute for each other when private professional calls were pressing. As their private practices grew they resigned from time to time but succeeding graduates of the hospital followed in their footsteps and so maintained the constant staff of anesthetists.

This method proved fairly satisfactory until two years ago when the capacity of the hospital was greatly increased, two new operating rooms and a maternity service having been added. It was found impossible to retain the services of a sufficient number of doctors skilled in anesthesia for a sum the hospital could consistently expend for this service. It was therefore decided to try trained nurses as anesthetists. Accordingly four nurses who were completing the post-graduate course in the hospital and who had been noted as being especially observing, careful and conscientious, were selected and placed under instruction of the before-mentioned visiting anesthe-

tists.   This training covered a period of four months and embraced verbal instruction, familiarization with the various apparati, constant observation, etc., and finally administration under the critical observation of the instructor.

These nurses were found to be quick to learn, intensely interested in the work, and became expert anesthetists.   They live in the Nurses' Home adjoining the hospital, and are always available, day or night, for obstetric or emergency cases.   That they are interested in and enjoy the work is apparent from the fact that three of the original four are still at the hospital and the fourth is continuing the work elsewhere.

One of the original instructors is still retained as visiting anesthetist with general supervision of the work of the department.   He is available for any especially difficult ward case and is on call for private room cases when the surgeons request.

The routine anesthetic given at the Woman's Hospital consists of gas-oxygen induction followed by drop ether on an open mask. A mechanical device known as the Montgomery etherometer (devised by one of our instructors) for administering drop ether is used in practically all ether anesthesia.   It is simple in mechanism, easy to control and can be regulated to supply a definite number of drops per minute.   This insures a steady, even supply of ether and an unvarying degree of anesthesia.   The patient is no longer deluged with ether one minute and restless for want of it at another.   Gas-oxygen throughout is given in suitable cases.

### THE MATERNITY DEPARTMENT.

The original act of incorporation for the establishment of the Woman's Hospital announces in Section I—the formulating "of a body corporate, with power to establish, maintain and conduct a hospital in the City of New York for the treatment of diseases peculiar to woman, and for the maintenance of a Lying-In Hospital."

In the year 1910 the Board of Governors established a Maternity Service, by designating a certain number of private rooms to be used exclusively for private maternity patients under the care of the attending surgeons.   A head nurse was placed in charge and a delivery room equipped.   Later additional, less expensive rooms and small wards of two and three beds, about twenty beds in all, were added to the service.   A room was also fitted up as a nursery.   Dr. Franklin A. Dorman was appointed Obstetric Surgeon with membership in the surgical board.   The service increased so rapidly that

the need of still more beds and a special maternity staff soon became evident. Accordingly another ward of twenty beds was provided, also another large delivery room, a labor room, chart room, two nurseries, examination room and isolation ward. Provision was also made for a resident salaried obstetrician, an assistant attending obstetrician and an out-patient staff.

During the year 1917 over six hundred confinement cases were cared for.

### THE OUT-PATIENT DEPARTMENT.

The Out-Patient Department has large, commodious quarters on the ground floor of the Thompson Pathological Building. The waiting room is in charge of a registrar who interviews all applicants and decides upon their claims to charity. A personal history is taken of all patients and they are then referred to the nurse in charge of the department, who takes a medical history. Following this they are shown to the dressing room by a pupil nurse and prepared for examination. Entering the examination room in turn they are examined and treated by the attending physician. After examination the patient returns to the office and is advised by the doctor as to her condition, etc. If the doctor thinks the patient will be helped by local treatment she receives a card on which are the days and hours she may return. If an operation is thought advisable, the patient receives a recommendation card which she gives to the registrar and is then shown by her to the main office where she may arrange for entering the hospital.

The regular gynecological clinic is held from 9.00 to 10.00 A. M. and from 2.00 to 3.00 P. M. every day.

There is a cystoscopic clinic held on Tuesdays and Thursdays at 11.00 A. M. The electrical clinic is on Monday, Wednesday and Friday at 4.00 P. M.; x-ray at 5.00 P. M. The obstetrical prenatal clinic is held every Tuesday and Thursday at 3.00 P. M. During the year 1916–1917, 7118 patients were examined, treated and advised, and 12,616 consultations were held.

The Electro-therapeutic Department is thoroughly equipped with the latest and best apparatus, all forms of electric therapeutics are efficiently applied and the x-ray work is of an especially high order. During the past year over 500 cases were referred to this department for x-ray pictures. The proximity of the out-door clinics and the cystoscopic department to the x-ray room facilitates reciprocal confirmation of diagnosis that is invaluable. The hospital patients likewise profit by the convenience of these departments. In all

appropriate cases x-ray findings and the actual pictures form a part of the routine histories.

### THE SOCIAL SERVICE DEPARTMENT.

A social service worker has been occupied at the hospital for many years. The department was not officially recognized by the Board of Governors, however, till 1912. The staff consisted of a trained social service worker, giving part of her time on clinical work for a few hours each day, and one trained nurse working on full time.

In May, 1916, the organization was made a regular department of the hospital to be supported from the hospital funds and as the work had grown it was found necessary to have a clerical worker working full time. The work at this time was put in charge of a graduate nurse who had had social service training and the department was asked to take charge of the return case work of the hospital.

The department now consists of three graduate nurses, a pupil nurse spending two weeks time in the office and visiting the homes, and one clerical worker. It endeavors to further the work of the surgeons by teaching patients in their homes to take proper care of themselves and carry out the doctors' orders. While a patient is in the Hospital care for her children is provided if necessary and daily reports are brought to her. If her husband is out of work the department endeavors to interest the proper agencies to secure employment for him, so that the patient's mind may be at rest. Special nourishment and abdominal belts when needed are furnished or are procured through the coöperation of other relief societies. The wards are visited daily and should a patient need further care when discharged from the Hospital she is sent to a convalescent home.

In July, 1917, the free obstetrical ward was opened, and the social service nurse was assigned the prenatal work in connection with the clinic, also teaching the mothers in their homes after confinement to care for themselves and baby.

Since social service was recognized as a department of the Woman's Hospital in 1912, the workers have taken care of 4583 women and girls from the wards and dispensary, have made 11,482 visits in their homes and 3768 visits in the wards, have sent 837 to Convalescent Homes and 396 to other hospitals for care which they could not receive at the Woman's Hospital, have consulted and advised 5791 in the social service office and have given 543 material relief, such as money, abdominal belts, food and clothing.

A Department of Pharmacy fully equipped with all the chemicals and drugs ordinarily in demand in a surgical hospital is maintained

and all aseptic and antiseptic solutions required are made up and prescriptions of every kind written by the surgeons are compounded. A professional pharmacist is in daily attendance. She is also a member of the board of instruction in the nurses' training school.

The pharmacy supplies all the medicines for both the house patients and for the clinics. The latter are charged twenty cents for each prescription. Those who cannot afford this receive the medicines free.

### THE WOMAN'S HOSPITAL SOCIETY.

The Woman's Hospital Society is an outgrowth (reorganization) of the Woman's Hospital Alumni Society which met once a year as a sort of "get together" association. The present society includes not only the alumni of the hospital but the attending and assistant attending surgeons who may not be alumni, cystoscopists, radiographers and pathologists. Its active membership now numbers sixty.

The object of the society is to cultivate social intimacy, maintain interest in the Alma Mater, bring out matters of scientific value in the special line of the Hospital's work and advance the science of gynecology. The transactions have been published regularly for a number of years in various journals. Its meetings are held four times a year.

### THE HOSPITAL BUILDINGS.

The exterior of the building is the French Renaissance. It has a frontage of about 400 feet on 110th Street overlooking the property of the St. John's Cathedral, and the St. Luke's Hospital on the other side of the cathedral grounds. The building has two lateral wings, each 100 feet deep jutting out toward the south, which form on the rear toward 109th Street a court protected from the cold winds and deriving the full benefit of a southern exposure. Here is a porte-cochere with entrance drive, a service court and an automobile shed. On the front of the building is a terrace in which the boiler room and the dynamo room are placed, so that the building itself may be relieved of vibration in connection with its mechanical equipment. The court at the rear has been laid out to form a closed garden for the use of the patients, with a tennis court for the doctors.

The material of the exterior is of granite up to the first window sills, and limestone to the second story sills, then light gray brick with limestone to the cornice line, above which the detail has been executed in terra-cotta.

The building has been planned to bring the different services in suitable connection with each other in order to make the management of the hospital as economical as possible. The laundry, kitchen, and operating room have all been placed in the attic in order that the less agreeable features of the management might be isolated as far as possible.

The basement is entirely given up to the clinic and the men servants' quarters and to the different rooms which are necessary in connection with sterilizing, filtration, ventilation, autopsy, morgue, etc. The first floor contains the administration rooms and the doctors' quarters, while the west wing is given to the chapel, which rises through two stories. The second and third floors are devoted to private suites for patients. Most of these rooms are arranged in pairs with a bathroom between. The fourth floor consists of two large wards located in the wings, each containing twenty beds. In addition there are in the main building some endowed wards facing toward the south, while all the rooms along the north side are devoted to different uses as duty rooms, locker and toilet rooms, and other services in connection with the wards.

The west wing, known as the Thompson Pavilion, provides accommodation for the Thompson Laboratory which occupies two floors, two operating rooms and their accessories, a number of private rooms for patients and the out-patient department in the basement. The east wing is the Nurses' Home. Both wings have sun parlors and roof gardens.

While especial study has been given to the layout of the hospital in relation to economy of service, still greater attention has been devoted to the sanitary and hygienic features. The building itself is absolutely fireproof, no inflammable materials being used anywhere in its construction. With the exception of the doors, the shelving, the window sashes, there is no finish or other woodwork anywhere in the building. All surfaces are kept flush, and all angles both in the woodwork and in the plasterwork are rounded at a suitable radius. The doors are oak, veneered but without panels, and every angle and corner of the building has been so designed as to admit easy and suitable cleaning.

Another feature of the construction is an air space 1 foot wide, which runs around the outside walls throughout the entire building. In this space are all plumbing, heating, and ventilating pipes, brine pipes, electrical conduits, etc. This arrangement not only makes it possible to install additional systems in the building, but also affords an air space which prevents any moisture from being felt

in the different rooms, as well as tending to keep the temperature of the walls themselves at an even degree.

The main corridor of the first story, as also the toilet rooms, are finished in gray Tennessee marble. The operating rooms are also finished throughout in the same marble, and all angles have been rounded in the same manner. The stairs are of "Taylorite" set in cast-iron, and as elsewhere all angles are carefully rounded. The same system has been pursued in regard to the shelving and counters. The same construction has been carried through the plumbing fixtures, seats and bathtubs, all of which are set in the floor or against the wall at a curve flush with the surface, admitting of no corner or crack where dust and microbes could collect.

The building has a complete system of sterilizing. Not only is the water and all material which is used for surgical operations properly sterilized, but there is also a plant in the basement, in which mattresses, pillows, etc., are subjected to a similar treatment, and a crematory for burning all waste and infected material. In addition to this sterilizing plant there is a filtration plant for all water used throughout the building. A brine system for the cold storage has also been installed in the attic and for the individual refrigerators in the different serving rooms.

Every floor of the building has two serving rooms, one for each wing, directly connected with the kitchen in the attic. For each one of these serving rooms there is an electric dumb waiter, which *stops only at that floor*. The serving rooms are fitted with an especial diet kitchen and all appliances requisite for warming and serving the dishes forwarded from the serving room in the attic.

The heating and ventilating of the building is accomplished by the use of two systems, the direct and the indirect; all offices and patients' rooms, wards and operating rooms are heated and ventilated by the indirect method, in which fans located in the basement force heated air through a system of metal ducts to the various rooms; this air first passes through screens for the removal of dust and impurities. It then flows through coils of steam pipe where it is heated to the required temperature before reaching the fans.

Those parts of the building not provided with indirect heating and ventilation are furnished with steam radiators. The vitiated air is removed from all parts of the building through another system of ducts connected to large fans in the upper part of the house by means of which it is drawn up and forced out through chimneys on the roof.

# INTERMITTENT HYDRO- AND PYONEPHROSIS IN THE FEMALE WITH SPECIAL REFERENCE TO THE ABNORMALLY MOVABLE KIDNEY AND URETER.

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(With twenty-two illustrations.)

THE term intermittent as applied to hydro- and pyonephrosis implies a period of distention of the kidney pelvis and a period of nondistention. The amount of distention will vary from that caused by a collection of fluid slightly in excess of the normal capacity of the pelvis to a very large amount.

When distention produces an appreciable tumor, the tumor will be present at one time and absent at another, or after several periods of appearance and disappearance may fail to subside.

For the purpose of convenience I shall use the word nephrectasis when referring to distention of the kidney pelvis, without regard to the character of the fluid. The condition to be considered is mainly that of hydrostatic pressure, whether the contents of the tumor be urine with pus or without pus. The etiology of infection where a purulent fluid exists will not be considered.

## ETIOLOGY.

Intermittent nephrectasis may occur at regular or irregular intervals. The regular interval type is the result of obstruction of the urine stream, dependent directly or indirectly upon abnormal mobility of the kidney. The irregular interval type is the result of obstruction of the urine stream, not directly dependent upon abnormal mobility of the kidney. Abnormal mobility of the kidney may exist, but a fixed kidney is here the rule.

In the regular interval type the obstruction may be due entirely to an acute angulation of the ureter following a pronounced change in the position of the kidney, or to pressure upon the ureter by a

tumor attached to an abnormally movable kidney. In the irregular interval type the factors causing obstruction may be a stricture, the result of an infection or injury, a stone, a new growth, pressure on the ureter by a retroperitoneal body such as a kidney tumor, or pressure by an intraperitoneal body, such as a fibroid tumor or a pregnant uterus. Angulation or kinking of the ureter may enter as an additional causative factor.

Transient polyuria may also be an additional factor in both the regular and irregular interval types.

The obstruction in the regular interval type is usually complete, but may be incomplete and will appear or disappear according to the position of the kidney. As the position of an abnormally movable kidney is dependent upon the position of the patient, the obstruction occurs during the day, while the patient is in the erect or sitting posture and disappears at night when the recumbent position is assumed. The obstruction in the irregular interval type is usually incomplete but may be complete; the primary factor, however, remains permanent and usually acts independently of the position of the kidney although the change of position of the kidney may exaggerate or lessen the obstruction.

In the regular interval type the general direction of the ureter is normal unless influenced by a body external to it. In the irregular interval type the general direction of the ureter may be either normal or abnormal.

It is the rule in cases of prolapsed kidney for the lumbar or abdominal portion of the ureter to descend with the kidney. Usually the degree of prolapse, with a curve in the upper portion of the ureter, follows closely the degree of prolapse of the kidney (Fig. 5). When this is not the case the curve of the ureter becomes more and more marked as the result of the fascial support of the ureter, in the immediate region of the curve, failing to yield or follow the line of fascial cleavage in the process of descent of the prolapsed kidney. Here an acute angulation of the ureter forms with resulting interference to drainage and the damming back of the urine in the pelvis of the kidney (Fig. 2). When therefore the position of the ureter does not change with the change of kidney position, an acute angulation results which constitutes an obstruction. When the ureter prolapses with the kidney there is usually but little interference to the urine stream (Fig. 10).

A stone in the ureter must cause either partial obstruction of the urine stream, complete obstruction with or without necrosis of the ureter and extravasation of the urine in the perirenal tissue, or ex-

pulsion of the stone.   It may occasion partial or complete distention of the kidney pelvis, but its presence alone can never account for the regular intermittent type of nephrectasis.

Inflammation of the kidney parenchyma as in tuberculosis of the kidney, may diminish the capacity of the ureter by clogging it with débris, or by thickening its walls. Inflammation of the kidney pelvis or inflammation in or about the intestines may result in the thickening and contraction of cellular tissue surrounding the ureter and thus enter as a causative factor in obstructing the urine stream.

A supernumerary or accessory renal artery passing in front of the ureter is considered by many authorities an etiological factor in nephrectasis. That the crossing of the ureter by an artery is not in itself sufficient to seriously disturb the flow of urine through the ureter is demonstrated in the female, as shown by the relationship between the ureter and the uterine artery.

In order for an artery to act as a constrictor the direction of the force it exerts upon the ureter must be more or less at a right angle to the general direction of the ureter, therefore the only conditions under which I can conceive of an accessory renal artery being the origin of an obstruction to the urine stream, are when the artery passes in front of the ureter, is attached to the lower pole of the kidney and the upper pole is displaced forward and downward.

I have met with accessory renal arteries attached to the lower pole six times in operating upon the kidney and in no instance did an appreciable pelvic distention result. Therefore I have not been able to demonstrate, to my own satisfaction, the importance of the accessory artery as a causative factor in nephrectasis; furthermore in none of the cases to be related did an accessory renal artery exist.

Transient polyuria may occur in abnormal or normal individuals as the result of temporary excitement, intestinal indigestion, sudden change of temperature, use of drugs, or increased consumption of coffee, tea, beer or water.

When polyuria occurs in a patient with any of the abnormalities of the kidney or ureter mentioned, the kidney pelvis may distend to many times its normal size and force the upper pole into close contact with the diaphragm. The upper pole may fix itself to the region of the diaphragm as the result of changes in the renal and perirenal structures from hydrostatic pressure; but its fixation will not necessarily prevent a recurrent attack of distention for the reason that saculation of the kidney pelvis, if great, is usually permanent, and the collection in the sac when polyuria recurs, will

produce sufficient external pressure upon the ureter to seriously retard or obstruct the urine stream (Fig. 11).

It is interesting to observe that under these conditions, pressure within the distended kidney pelvis will eventually reach a point where it will overcome the resistance offered by the pressure of the distended sac on the ureter, so that when this pressure in the kidney pelvis exceeds the pressure upon the ureter from without, the urine will flow more rapidly through the ureter until the pressure in the kidney pelvis lessens. This mechanical adjustment may eventually terminate in relief, or may continue indefinitely and demand surgical interference.

### NEPHRECTASIS OF PREGNANCY.

*Nephrectasis of Pregnancy.*—The anatomical and mechanical reasons for nephrectasis during pregnancy, as commonly accepted, are to my mind not satisfactory. The slight obliquity of the pregnant uterus with its right border directed a little backward, is supposed to account for the high per cent. of right renal retentions. The region of pressure on the normal ureter by the pregnant uterus between the third and ninth months is supposed to be about where the ureter passes over the pelvic brim. This reasoning seems to me unsupported by facts, for if a vertical plane be passed immediately in front of the lumbar vertebra and sacral promontory, where with the iliac region the greatest amount of pressure would be exerted by the pregnant uterus, it will be found in front of the normally placed ureter. The vertebral column therefore projects beyond the normally posed ureter and acts as a protection to it (Fig. 14). If this projecting bony structure is nature's scheme of protection, interference with the urine stream by pressure of the pregnant uterus on the ureter can take place only when the ureter is displaced and assumes a position in front of the vertebra or the ilium.

That the abdominal or lumbar portion of the ureter is at times so displaced cannot be questioned.*

The direction of the ureteral displacement where there is associated with it an abnormally movable kidney, may be toward or from the spinal column, and usually the change of position takes the form of one or more curves. According to my observations the greater curve is as a rule in the direction of the spine. It is the exception

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*Figs. No. 5, 7, 9, 10 and 13 demonstrate the possibility of the ureter being caught between the vertebral column and pregnant uterus thus causing interference to the urine stream. In the non-pregnant condition such cases usually escape distention of the pelvis of the kidney, because the ureteral support yields with the kidney resulting in pronounced curves, which as a rule do not interfere materially with the flow of urine.

when it is away from the spine.  If the curve passes in front of the spine or the crest of the ilium during pregnancy, the ureter may be subjected to such pressure between either of these resisting surfaces and the pregnant uterus, as to interfere materially with the urine stream.  This shifting, however, occurs usually when the patient is in the sitting or standing posture or when the prolapsed kidney and ureter have assumed their lowest and most abnormal positions.  Should a woman several months pregnant with such a prolapsed kidney and ureter assume a standing or sitting posture and lean forward, then assume a recumbent position, it can be readily seen that the ureter may be caught between these resisting bony structures and the uterus.

The following facts also tend to support this view:

(1) A large percentage of these cases occur on the right side, which corresponds with the fact that a large percentage of prolapsed kidneys occur on the same side.

(2) Granting that the theory of right rotation of the pregnant uterus explains the more frequent obstruction of uterer on the right side, it does not explain the obstruction on the left side.

(3) When the pregnant uterus is sufficiently large to give support to the kidney, the ureter usually straightens out and escapes pressure with relief to the patient.

Independent of kidney and ureteral position, however, the factors mentioned as causative in the irregular interval type of nephrectasis, may exist coincident with pregnancy and occasion nephrectasis during pregnancy.

The type of nephrectasis commonly recognized in the pregnant woman is that where pus is found in the urine.  The presence of pus associated with pain in the kidney region, is, of course, the chief factor here in directing the attention to the origin of the disturbance. Pain alone occurring in the right abdominal region during pregnancy, is usually not sufficient to suggest a kidney lesion and hence it is that not infrequently a minor degree of nephrectasis exists as the source of the pain, which has been considered mistakenly appendicular colic, intestinal colic or "ovarian neuralgia."  Such a condition may be transient and be relieved automatically by the woman assuming, for a period of time, the semiprone, sitting or knee-chest position. When the uterus is emptied the direct cause of interference to the urine stream is removed and unless some permanant causative factor exists these organs will resume their normal function and no evidence will remain of their having entered as factors in the disturbance during pregnancy.

Pilcher has pointed out that pyelitis, pyelonephritis and pyone-phrosis when occurring with pregnancy are terms commonly used synonomously.

Infection of the kidney or kidney pelvis is not a condition peculiar to pregnancy. In fact it commonly occurs independently of preg-nancy, therefore its association with pregnancy is not sufficient evidence to conclude that it is dependent upon this condition. Dis-tention of the kidney pelvis, however, when it occurs within certain definite periods of pregnancy, may with reason be attributed to the same, because it is relieved through posture or the emptying of the uterus.

Pilcher (*Surgery, Gynecology and Obstetrics*, vol. x, page 168, 1910) in summarizing an article on this subject, states that in his opinion pressure on the bladder is the usual cause of the ureteral obstruction and that there is more to be gained by favoring drainage of the renal pelvis by a position in which the kidney remains on a higher level than the bladder, than there is from any fancied relief of pressure on the ureter. He bases his argument particularly on a case in which he was able to collect about 2 c.c. of urine in ten minutes from a diseased right kidney when the patient was in a recumbent position, but collected at the rate of 4 c.c. a minute in a sitting position.

I do not believe that this is sufficient evidence to support his con-tention that because the kidney was raised above the bladder the flow was increased, but is evidence in support of the theory that the sitting position, by encouraging the forward position of the uterus, relieved the pressure on the ureter.

Pilcher relates another interesting case, one of pyonephrosis, which in my opinion is also evidence in support of the theory that the ureter is pressed upon by the pregnant uterus. On catheterizing the right kidney pelvis of a patient in her ninth month of pregnancy suffering from an acute pain on the right side, he found it contained 4½ ounces of residual urine and pus. Because of this large amount of residual urine in the pelvis of the kidney, the catheter was left in place for five hours. The patient was turned on her left side, head and trunk raised.

He further states that when the catheter was removed it had "become molded to correspond to the curves of the ureter" . . . which "showed the direction of the ureter to have been changed, so that it was pushed over further to the right." A catheter removed under these circumstances would doubtless be somewhat twisted, but the direction of the twists on removal could hardly be considered

conclusive evidence of the exact position of the ureter with respect to the median line.

The position of the ureter with respect to the median line can be determined only by the radiograph with catheter or some silver salt solution in the ureter, but if Pilcher was correct in concluding that the ureter in his case was deflected considerably to the right of its normal course with an "extra curve" between the brim of the pelvis and the kidney, then in my opinion the ureter was forced in front of the ileum and the point of greatest pressure on the ureter was at the point where it passed over the crest of the ileum. This argument is supported by the second case reported in this article (Fig. 11), where the ureter was deflected to the right or in front of the ileum and the catheter could not be passed beyond the crest, also by a case of minor displacement of both kidney and ureter, not reported here, where the greater curve was in the direction of the ilium.

Dr. W. C. Danforth (*Surgery, Gynecology and Obstetrics*, vol. xxii, page 723, 1916), cites an interesting case in support of the argument that the pressure of the pregnant uterus on the ureter is the cause of obstruction to the urine stream. A woman in the fourth month of pregnancy was, when first seen by him, suffering severely with pain over the right kidney region. The catheter entered the left ureter without difficulty. The urine was perfectly clear. On the right side, the catheter could be passed only about 10 cm. "from the bladder." There it met with a positive obstruction. The patient was then turned upon the left side in order to permit the uterus to move forward and away from the ureter. The catheter then passed to the kidney without difficulty and turbid urine flowed freely, showing that it had been confined under great pressure. The fact may be emphasized in this connection that while a prolapsed kidney usually has associated with it a displaced ureter, the ureter is not commonly displaced in a manner which would subject it to pressure; hence the comparative rarity of nephrectasis during pregnancy.

<div align="center">DIAGNOSIS.</div>

In cases of nephrectasis, where the tumor has reached a palpable size and its anterior surface is in apposition with the anterior abdominal wall, we usually expect to find resonance immediately over the tumor and dulness in the flank, but in fact the location of resonance and dulness varies, (1) with the kidney involved, *i.e.*, right or left; (2) with the extent of mobility or fixity of the kidney; (3) with the amount and direction of the distention of the kidney; (4) with the

amount of gas in the colon at the time of the examination; (5) with the extent of fixation or mobility of the cecum and ascending colon.

The highest point of attachment of the ascending colon is much lower than the highest point of attachment of the descending colon. The lowest point may vary considerably, but is usually about the iliopectineal line or the upper margin of the false pelvis. The average width of its attachment to the intraabdominal fascia is much less than that of the descending colon. For these reasons it will be usually found that in right nephrectasis where the tumor has attained considerable size, dulness in the flank and dulness over the tumor is the rule (Case III). Exceptions to this rule will occur when the colon or part of it is fixed externally to its usual position as the result of an inflammatory action about the cecum or following an operation for the removal of the appendix. A radiograph with bismuth in the colon is a most satisfactory way of determining the exact relationship of the colon and the tumor.

The descending colon is continuously attached to the intraabdominal fascia from the splenic region to a point well within the limits of the false pelvis. Here it blends with the sigmoid, which in turn is fixed to the fascial structure. Beginning therefore, at a very high point, the descending colon has a broad attachment extending laterally and is in its entirety a fixed and stable organ, so that when distention of the left kidney occurs, the descending colon, although it may be forced well forward, usually maintains, because of its position and fixation, its normal vertical direction. For this reason it will be usually found that in left nephrectasis where the tumor has attained a considerable size, dulness in the flank and resonance immediately over the tumor is the rule as exemplified in the second case to be cited.

Again, my study of a large group of abnormal movable kidneys through the median abdominal incision has led me to the conclusion that not infrequently the right prolapsed kidney is located well to the outer side of the colon, whereas the left prolapsed kidney usually remains posterior to the colon. Therefore, when there is superimposed upon this malposition of the right kidney a marked distention, the colon may be forced well toward the median line; but the relative position of the left kidney to the colon, under similar conditions usually remains practically the same.

Intermittent nephrectosis may be mistaken for renal abscess, single or polycystic kidney, hypernephroma or extravasation of the urine in the perirenal area. It may also be mistaken for a tumor of the ovary, liver, gall-bladder or spleen. The differentiation is,

however, not difficult if the history points to a subsidence and recurrence of the tumor at regular or irregular intervals. But when the tumor is of several days' duration the diagnosis may be difficult. If under these circumstances the cystoscopic examination reveals an intermittent flow of urine from the affected side, this, with the previous history of intermittent tumor formation, is evidence sufficiently conclusive to base a diagnosis upon.

In the first case to be related, the distention of the kidney pelvis was of sufficient size to be appreciated by touch and sight at regular intervals. In the second case the same was true at irregular intervals. In the third case distention of the kidney pelvis was at regular intervals but was not of sufficient size to be observed and even though it had been larger, it is doubtful if it could have been noted because of the presence of a large single cyst of the kidney parenchyma. In the fourth case the patient was never seen during a severe attack and even if she had been, it is doubtful if the increased size of the pelvis was ever sufficient to have been appreciated by sight or touch. In none of the other cases to be related was a distention of the pelvis noted objectively. The determination of the distention in these as in the third and fourth cases was by the subjective symptom, pain.

In the second case, when the tumor came under my observation, it had persisted for two days and two nights, increasing in size, although as shown by the catheter on the third day, the flow of the urine through the ureter was greater than from the normal kidney, being 3 drops to 1, with a short interval.

In acute inflammatory tumors, such as a perinephritic abscess, the temperature, blood count, etc., enter as important factors from a diagnostic standpoint.

In the single or polycystic kidney, also in hypernephroma, we have the history of the presence of a tumor for many years without interruption to the flow of urine.

In extravasation of urine in the perirenal area, we have the history of a blow or of some previous pathologic lesion, such as malignancy or stone.

In differentiating intermittent nephrectosis from all conditions mentioned, the history regarding intermission or nonintermission is the chief consideration.

The urine in hydronephrosis is clear and of low specific gravity. In pyonephrosis, we have an admixture of pus, sometimes blood and mucus. In neither instance, however, does an examination of the urine furnish information which might be considered pathognomonic.

## TREATMENT.

In considering the treatment of intermittent nephrectasis, it is to be noted that the condition may subside after one or two attacks and never recur. Such, however, is not the rule if the sacculation of the kidney pelvis has been considerable. When the attacks of pain are due to an acute pelvic distention as the result of an angulation of the ureter, and this angulation in turn dependent upon a prolapsed kidney, the best treatment, provided there is not an associated infection, is that of fixing the kidney.

If there be associated with a ptosed kidney a cyst of its parenchyma, the cyst should be removed and the kidney fixed (Case III) (Fig. 12), but if there exists structural disease of the kidney as the result of an infection (Case IV, V and VI) or if great distention of the kidney pelvis recurs as in (Case I) or without an accompanying infection (Case II) (Fig. 11), nephrectomy is the procedure of choice. If a stone in the ureter (Case VI) or a tumor external to the ureter is the cause of obstruction, their removal is the rational procedure.

In the first case to be cited, elevation and fixation of the kidney might have drained the pelvic sac and restored the kidney to normal function, but in view of the amount of pus expelled, the chance against such a result was considerable and, as the other kidney was healthy, the rational procedure seemed to be that of nephrectomy.

Likewise in the second patient, at the time that she came under my care, there seemed to be only one rational procedure, that of nephrectomy, yet could this case have been studied several years previously, it is possible that some other form of treatment than nephrectomy might have been adopted to advantage. Her history suggested polyuria as a factor. The cause of polyuria might have been discovered and remedies used to diminish the flow, such as bromide, morphine or atropine. Manipulation of the tumor and maintenance of the horizontal position might also have entered as elements in the treatment. The one method of procedure, other than nephrectomy which could possibly have been considered in the second case, when I saw it, was tapping. Complete cures have been affected by relieving the pressure in this way, but it has been usually necessary to repeat the tapping many times. Such treatment has also ended in death in cases which could have been cured by radical operation. My second case frequently obtained the same relief by position as might have been obtained by tapping, but the cause was not removed. At the time that I saw her, the attack had lasted longer than previous attacks without relief and it was reasonable

to suppose that the time for tapping had passed and the only procedure which offered a promise of cure was nephrectomy.

In fact when renal distention is very marked, the elastic tissue and muscular fibers of the renal pelvis are damaged to an extent which makes them incapable of returning to their normal state, therefore, catheterization of the ureter as a curative means is futile. In the lesser degrees of distention, before pernament impairment in the walls of the pelvis of the kidney has occurred, repeated ureteral catheterization may not only give relief but may save the tissues from irreparable damage.

Ureteral catheterization combined with position, semiprone or sitting, is of value when there exists nephrectasis during pregnancy. The maintenance of the semiprone position, opposite to side affected, for a considerable period and as often as necessary, is in itself a remedial procedure as by it the uterus falls forward and the pressure on the ureter is relieved. If both kidneys are affected the sitting or knee-chest position is preferable. It may be further noted in regard to position as a form of treatment that the dorsal position is applicable to cases of nephrectasis dependent upon an abnormally movable kidney, with an angulation of the ureter and also where there is a moderate collection in an old pelvic sac of a fixed kidney, but when this sac becomes greatly distended and is in itself a source of obstruction to the urine stream by direct pressure on the ureter, as instance in the second case to be reported, no position will give relief.

In the first case to be cited catheterization might have drained the cavity better than the recumbent position, but it is doubtful, besides the persistency of such treatment in chronic cases is extremely inconvenient.

In the second case to be narrated an effort was made to relieve the distention by means of a catheter, but, as the $x$-ray showed, it could not be passed further than the brim of the pelvis.

In the third case, removal of the tumor and fixation of the kidney were the rational procedures, as thereby the cause of obstruction was eliminated and proper drainage established.

In the fourth case structural disease of the kidney was extensive and removal of the kidney was thereby necessitated.

In the fifth case there were two or more cavities containing stones in the parenchyma of the kidney. There was besides, extensive infection of the kidney pelvis where were also several large stones, nephrectomy here was necessitated.

In the sixth case although the obstruction located in the pelvic

portion of the ureter was removed, the removal of the kidney was eventually necessary because of an existing tubercular involvement of the kidney.

Treatment, with a curative object in view must, therefore, depend upon the cause, and if the cause of distention cannot be determined, or if determined, cannot be removed, nephrectomy, when the remaining kidney is normal, is the procedure of choice; but if the patient has but one kidney, the kidney sac should be opened and a fistula established.

The objective signs of an abnormally movable kidney are so unmistakable and the subjective symptoms so characteristic, that the scant consideration given to the surgical treatment of the ptosed kidney seems incomprehensible.

Many of our foremost surgeons ignore absolutely the question of nephropexy for the relief of symptoms referable to the nervous and digestive systems associated with the prolapsed kidney. They believe that an effort to fix the kidney is called for only when there can be demonstrated a definite obstruction to the flow of urine as the result of renal position. This reason for not favoring nephropexy is, I judge, due to the fact that their technic fails to hold the kidney in position and therefore fails to give relief from symptoms.

Though many may deny the relationship between the abnormally movable kidney and certain subjective symptoms commonly associated with it, they should not fail to recognize the reasonableness in the claim that the law of interference in the circulation of other displaced organs and the resulting subjective symptoms, is applicable to the kidney when ptosed. An organ upon which the system so greatly depends for the elimination of its waste products, must be and is, richly supplied with blood, therefore any interference with its circulation is detrimental to its function and necessarily encourages destructive changes. In this connection, I refer particularly to the lowered resistance of the organ to tubercular invasion. In my experience, it has been a repeated observation that when tuberculosis of the kidney has not advanced to the extent of causing marked parenchymatous changes with resulting fixation, the organ is abnormally movable. I recall having followed a patient for four years or more as a simple prolapsed kidney with typical symptoms, who repeatedly refused nephropexy, but who finally had to submit to nephrectomy as the result of a sudden tubercular invasion.

Therefore, to those who do not believe in the operation of nephropexy from the standpoint of relieving certain subjective symptoms, I would earnestly suggest that they consider its advisability as a

prophylactic means, not only with the object of correcting the cause of interference with the flow through the ureter and thus preventing nephrectasis, but with the object also of eliminating renal engorgment which may act as a causative factor in tuberculosis of the kidney.

<div align="center">CASE REPORTS.</div>

CASE I.—Miss C. F., aged thirty-eight, was first examined November 20, 1903. Her chief complaints then were menorrhagia and metrorrhagia, fulness in pelvis, recurrent pains in lumbar region and severe headache at intervals. She described the pains as severe in character, lasting four or five hours and exaggerated on assuming the recumbent posture. They recurred about three or four times a year and had been noted for three or more years.

The pelvic and lower abdominal examination showed a large, uniformly rounded fibroma of the uterus, rising considerably above the pelvic brim. It was a definite pathological lesion and this apparent cause of all distress seemed so self-evident that an examination of the upper abdominal region which should have been made was not considered necessary.

Hysterectomy was performed November 21, 1903. I have no record to show that the upper abdominal region was explored at the time of operation. In fact, I am quite sure that all interest then centered in the fibroid and whatever other abnormalities existed were overlooked.

Her convalescence was uneventful except that shortly before leaving the hospital, and after being on her feet for several days, she complained of a pain in her right side much the same as she had experienced at intervals before the operation. I gave no thought to the symptom being the result of a permanent cause, believing the true element of distress eliminated when the fibroid was removed, and dismissed her as cured.

She went to the country for further convalescence. Not only did the symptoms of distress in the lumbar region persist, but their severity increased and they recurred more frequently. Certain symptoms which had not existed previous to the hysterectomy, namely nausea, vomiting and constipation appeared and during the three months she was away she lost 20 pounds.

On my first examination of her after her return, I found her in agony. There was discovered a large tumor on the right side extending from a point below the last ribs to the crest of the ilium and to the umbilicus quite movable and could be easily forced beyond the middle line. There was dulness in the flank and over the tumor.

The patient was immediately put to bed. Examination the next morning showed the absence of the tumor. The kidney alone could be felt but the urine was filled with pus. She was made to assume the erect position during the day. The urine passed during the latter part of the day was found free of any abnormality but the

tumor recurred by evening.    This procedure was followed for several days with identical results.

A radiogram was made but revealed nothing.    Ureteropyelography was not commonly resorted to at that time as an aid to diagnosis, so that a rare opportunity to secure what would have been, by such means, an interesting and valuable record was lost.

The diagnosis, however, was positive, namely, an intermittent pyonephrosis and on March 21, 1904, or about four months after the hysterectomy, nephrectomy was performed.

The body of the kidney was found at operation not particularly enlarged but the empty pelvic sac was as large as the kidney itself and when it was distended with fluid became twice as large, without the kidney proper sharing proportionately in the distention.

Since the operation fourteen years ago, she has been free from all symptoms and has gained 37 pounds.

The history of this case shows a more or less gradual onset of distention of the kidney pelvis, but when the tumor was removed and the support to the kidney taken away the organ prolapsed, further angulation of the ureter increased and nephrectasis occurred.

Many of the symptoms presented previous to the hysterectomy were similar to those which not infrequently accompany prolapse of the kidney.    In addition to those noted at the beginning of her history, she suffered from nervousness and always felt tired on awakening, even though she had slept well through the night, never felt rested.    Dreams were frequent and disturbing, emotional control was lost; or as she expressed it "she did not have the proper control over her feelings."

The only symptoms relieved by the hysterectomy were the severe headaches, fulness in the pelvis, menorrhagia, metrorrhagia and the increase of pain on reclining.    The other symptoms not only persisted but increased in severity.

A tumor in the lumbar region was not noticed by her until a month or more after the hysterectomy.    Also pain in the renal region which occurred every three or four months, was more frequent after the operation, until it became of daily occurrence, and whereas before the operation, she could relieve it by keeping a sitting posture for five hours or more, after the removal of the tumor she could get relief only in the recumbent position.

From a mechanical standpoint, these facts are very interesting and the explanation is, that the presence of the fibroid did two things:

*First.*—Its shape and size within the true pelvis were such as to cause marked pressure at some point on the right ureter which pressure was increased by gravity when the recumbent position was assumed, and relieved when the sitting posture was taken.

*Second.*—The fibroid rising considerably above the pelvic brim tended to support the kidney or at least to prevent further prolapse. When the fibroid was removed and the support taken away the kidney prolapsed to an extreme degree and though the pressure on the ureter in the pelvis was relieved, the angulation of the ureter increased and the kidney pelvis became markedly distended.

CASE II.—Mrs. T. M., forty-one years old. Married ten years. Three children, youngest two years old. From the time of her maturity, dysmenorrhea was severe with an excessive menstrual flow lasting seven days. She was always more or less nervous and hysterical. She could not sleep on the right side because of distress from "something falling over from the left."

For ten years previous to marriage, there occurred periodic pains in the left lumbar region about every three months but no enlargement was noticed. The intervals of pain lessening gradually until at the time of her marriage, they recurred every six to eight weeks increasing in severity with each onset. She carried three conceptions to full term and about the fifth month of pregnancy in each instance, she was relieved of renal distress. After her labors, the pains recurred as before. She first noticed the enlargement in her side following the birth of the first child, eight and one-half years ago. The enlargement always disappeared after reclining for a few hours. After her first labor, the recurrent attacks with enlargement were noticed about every two months. The intervals gradually diminished to every six weeks, one month and then three weeks. It was also noticed that the tumor, when it recurred, would be larger each year and it required a longer time in the recumbent position to reduce it; during the last year at least twenty-four hours were usually required to complete its reduction.

When the patient presented herself at my office, she informed me that her case had been diagnosed several years before as one of "floating kidney," but I was unable to verify the diagnosis. The lower pole of the kidney could be felt but the organ did not seem to possess abnormal mobility and I was unable to pass my hand above the upper pole.

Her symptoms, as then related, were constant eructation of gas, no nausea or vomiting. She was nervous and apprehensive but slept well and had no bad dreams. For six years she had been wearing an abdominal support without relief. Digestion was usually good and she was gaining steadily in weight. An intermittent enlargement in the left kidney region with accompanying pain constituted her chief complaint. Not being able to make a diagnosis, I advised a radiogram; also should the tumor recur before a picture could be taken, I instructed her to summon me at once. A week or more after I saw her at my office, I was called to her bedside, where she had been confined for forty-eight hours with a large tumor mass extending from the diaphragm to the ilium and from the lateral abdominal wall to the middle line. I immediately transferred her to the hospital and had her catheterized and x-rayed.

Catheterization was incomplete as the instrument could not be passed beyond the crest of the ilium, but the flow of urine through the catheter was at intervals, perfectly clear and of low specific gravity. Percussion over the tumor showed resonance, but dulness in flank.

Notwithstanding the evidence obtained as to the renal origin of the tumor, doubt was expressed by council, and to determine posi-

tively its character an abdominal incision was first made over the same. The exploration through this wound although unnecessary was instructive, as the outlines of the retroperitoneal mass could be clearly followed from the diaphragm to the false pelvis, and an exact mental picture secured of the relationship between the greatly distended kidney pelvis and the descending colon.

The patient was then turned on her abdomen and the lumbar region opened. The distended kidney was aspirated and 2½ quarts of clear urine withdrawn. The upper pole of the kidney was found firmly fixed to the fascial structure in the region of the diaphragm and lower ribs and was dislodged with considerable difficulty.

Nephrectomy was successfully performed and the patient at the present time is enjoying perfect health.

According to the history of this case, there existed for many years a recognized prolapsed kidney. Accompanying this condition there doubtless existed also a displaced ureter. The greater curve of this displaced ureter may have been in a direction away from the vertebral column and as the kidney pelvis distended the outward position of the ureter became fixed. The catheter failed to pass beyond the crest of the ilium as shown by radiogram, probably because at that point there was a sudden posterior change in the direction of the ureter, due to the fact that the area above the ilium traversed by the ureter yielded to the pressure of the tumor and carried with it the ureter.

CASE III.—Mrs. J. C., aged forty-eight, married thirty-two years, eight children, four miscarriages. Menopause at forty-six. In October, 1915 she had a severe fall on the ice, immediately after which bleeding from the vagina occurred, with pain in back which became more or less continuous. There was also pain in the midde and lower abdominal region during the day, which she described as simulating labor pains. Relief was obtained only when she assumed a recumbent position.

Previous to her fall she remembers having had a persistent tired and sleepy feeling. At present she sleeps well, but invariably wakes just as tired as when she goes to bed. Appetite and digestion not good. Nauseated particularly at time of pain but does not vomit. Twelve years ago she was supposed to have had gall-stones. Vomited bile on and off for ten years. Lost considerable flesh during the last year and is at present very thin. Frequency of micturition every two hours during the day and twice during the night.

Examination of right side showed a tumor extending from cecal region to umbilicus and rib, freely movable.

Cystoscopic examination showed slight urethritis and trigonitis. Catheters passed up both ureters, examination of both specimens negative, excepting uria on right side 11.3 per cent., left 20.5 per cent. Capacity of pelvis of right kidney, 25 c.c.

When thorium was injected into the kidney pelvis, the same character of pain followed as she had experienced for a year or more previously.

After the three radiographs here shown were taken and a diagnosis made of nephroptosis with hydronephrosis and cystoma of right kidney, the abdomen was opened directly over the mass.  A large movable retroperitoneal tumor presented itself.  The cecum and ascending colon were practically hidden from view but on retraction of the abdominal wall they were found displaced by the tumor inwardly.  The peritoneum and fascial covering of the tumor were incised and the kidney with a single cyst about the size of a small grape fruit was delivered through the abdominal wound.  The kidney was very movable which fact facilitated the following surgical procedure.  The cyst was found to grow out of the convex border of the kidney and to displace the greater portion of the kidney substance in this region.  It was found on dissecting away the cyst that its wall extended to and was in direct contact with the kidney pelvis.

A careful dissection was necessary in order not to injure irreparably the walls of the kidney pelvis, however, during this dissection two small openings were made in the pelvis which were immediately closed with fine catgut.  The tumor was removed intact.  In closing the kidney wound, which extended from pole to pole, several interrupted catgut sutures were made to penetrate deeply the opposing kidney surfaces.  Two chromic sutures (No. 3) were passed completely around the kidney, one below and one above the hylum.  On passing these sutures the fibrous capsule was penetrated at several points to fix the suture in position.  Their free ends were passed through the muscle of the abdominal region and out through the skin and tied over a small bolster of iodoform gauze.  These two sutures when tied prevented further hemorrhage by holding the opposite cut surfaces in contact and fixing the entire organ to the posterior wall.  The fascial and peritoneal incision over kidney was closed.  The patient made an uninterrupted recovery.  Examination four months after operation showed a successful result both mechanically and symptomatically.

It is probable that there existed prior to the fall, all conditions found after the fall; namely, nephroptosis, hydronephrosis and a single cyst of the kidney.  The fall undoubtedly occasioned a great strain on the pedicle of the kidney and because of this sudden drag the symptoms which existed previously in a comparatively mild form now became distressing.  While this case must be classed as a regular interval type of intermittent nephrectasis it differs from the first case related in that the obstruction of the urine was incomplete, that is the obstruction was not the result of an angulation of the ureter but of a general pressure on its abdominal or lumbar portion due to the tumor forcing it far out of its normal course.

The radiograms taken before operation show a most interesting situation.  That taken in the recumbent position (Fig. 12) shows the kidney at its highest elevation and the influence of the tumor upon the position and course of the ureter.  That taken in the erect or sitting posture (Fig. 13), front view, shows a marked prolapse of the kidney and a sudden change in the direction of the ureter.  It also suggests that the influence of the tumor upon the direction and

course of the ureter is such as to occasion greater pressure than in the recumbent position. That taken in the erect position (Fig. 14), a profile view, shows that the kidney with tumor has fallen forward and downward and that a more gradual curving of the ureter exists than is indicated in the front view.

The following case, though not complete, is reported because of the unusual radiographic study and the interest and value of its history taken with the foregoing cases. As the kidney lesion is structural, the result of an infection and as it is of long standing, progressive, and interferes seriously with the proper performance of her work, nephrectomy is proposed. It is to be regretted that circumstances prevent the operation from being performed in time to include the findings in this report.

CASE IV.—Miss M. L., aged forty-one. Shows old scars of tubercular gland of the neck, which drained for six years and healed in 1904 by the administration of Lugol's solution.

In 1909 she contracted what she termed a severe cold and for three months was distressed with frequent and burning micturition. From 1909 to 1912 she had regular interval pains in the sacral region, these pains usually lasted two or three hours, were accompanied by a chill and followed by nausea and not infrequently vomiting. If she turned on her left side during these attacks, she would experience a feeling of discomfort or "drag" in the right lumbar region. The symptoms were suggestive of an appendicular involvement and in 1912 the appendix was removed. After this operation attacks were less frequent and less severe but continued to occur every month or two until June, 1917. From June to September, 1917, no attack occurred. During September, October and November attacks returned with greater severity and frequency, about every two weeks. The kidney pelvis was injected with thorium December 14, 1917. By this injection the same character of pain was created, greatly intensified a few hours later, for which she sought relief. Since that date she has had no recurrence of pain. Bowels, normal. Vesical symptoms, negative.

Cystoscopic examination (Dr. Bugbee) shows edema about mouth of right ureter, catheter partly obstructed at 15 cm. but entered pelvis at 25 cm. Very rapid flow of urine. Urine, pale, contains flakes. Left side, normal. Thirty cubic centimeters of thorium injected into the pelvis of right kidney. A radiograph showed a large pelvis with flattening of calyces.

Tentative diagnosis: tuberculosis of the kidney, pyonephrosis.

Examination of urine from the right side showed staphylococci but no tubercular bacilli. Urine from left side, normal.

With regard to the cause of attacks, she was of the opinion that they frequently followed a hard day's work and also at times when she was disturbed as the result of approaching menstruation. As evidence corroborating the first statement, it will be noted that she spent the months of June, July and August, 1917, without an attack. During these three months she was in the country with little or no

work to do. The attacks returned, as previously stated, on the resumption of her work and frequently preceded menstruation. She has had no attack since the pelvis was distended with thorium, which she attributes to the fact that since the discovery of the kidney lesion her employer has been most considerate and the work required of her has been greatly lessened.

This history suggests several elements as probable factors in the causation of attacks. First, working in the upright position seemed to have some definite connection with the attacks, as she was absolutely free from them for three months when not so engaged. Second, the attacks occurred not infrequently at about the time of menstruation. These two facts suggest engorgement of the vessels of the internal genital organs, with resulting pressure on the lower ureter, but more suggestive to my mind than this is a resulting engorgement of the kidney from standing and an increased output of urine from nervous excitement.

The sudden posterior change in the direction of the upper part of the ureter could, because of the evident fixity of this area, be converted into a definite obstruction to the urine stream on even a slight descent of the kidney, if this change of position was of considerable duration.

The thorium injected into the ureter and pelvis of the kidney was more serviceable in giving the true course of the ureter and position of the kidney, than if the catheter alone had been used, even had it passed through the entire ureter and entered the kidney pelvis.

The obstruction in the upper ureteral area where the shadow is deficient, may have been the result of the infection within the kidney or kidney pelvis; that is, an area of cellular tissue in the region of the upper ureter may have become, at the time of the infection, so involved as to lose its elasticity, and by contracting, limit the capacity of the ureter in that immediate vicinity, or act as a factor in the formation of an angle by preventing a change of position of the ureter, with change of position of the kidney.

The shadowgram (Fig. 15) was taken with the patient in the recumbent position. The upper portion of the ureter is outlined by thorium only. It is to be regretted that a picture was not secured in the standing posture at the same time, in order that the change, if any, occurring in the tortuous section of the ureter might have been determined.

Six weeks after Fig. 15 was made and three hours before nephrectomy was performed, thorium was injected into the kidney pelvis (but a smaller amount than here used) and a shadowgram made in the erect position. This showed (Fig. 16) that the catheter here passed the constriction in the upper portion of the ureter and in so doing eliminated the irregularity in the course of the ureter. The kidney pelvis, less distended than before, only 8 cm. having been injected, is seen to have assumed a lower position, and the upper portion of the ureter shows a gentle curve. The influence of the change of position of the kidney on the tortuous portion of the ureter was therefore not determined because of the influence of the catheter.

Although this change of position of the kidney, may have tended to make more pronounced the constriction in the upper portion of the ureter, I am of the opinion that the low position of the kidney in this individual case, did not play an important part in the causation of nephrectasis, and that the chief factor was the constriction of the ureter, which existed in all positions. The influence of this factor being constant, there was in consequence, a state of chronic distention of the kidney pelvis. This view is supported by the following facts:

(1) When the ureteral catheter was inserted, the urine which escaped seemed to be under great pressure.

(2) At the time of operation, the pelvis was found markedly distended and remained so even after considerable handling of the organ. Contents measured 30 c.c.

Operation, Feb. 1, 1918. The kidney was found with limited mobility, and with numerous resisting bands of tissue surrounding it. These were with some difficulty freed, and in most instances had to be cut. The bands about the upper portion of the ureter were particularly conspicuous. No accessory artery was discovered. The ureter was freed down to the pelvic brim and was here encircled by a ligature of plain No. 2 catgut. A small clamp was placed a little above the ligature and the ureter cut between. The renal vessels were ligated with plain No. 2 catgut and the kidney removed. The manipulation necessary to free the kidney and the ureter did not seem to lessen the distention of the kidney pelvis. This fact would suggest the existence of another ureteral constriction which corroborated Bugbee's observation of a constriction met by the catheter 15 cm. above the bladder.

CASE V.—Mrs. C., aged thirty-nine. First seen Sept. 6, 1907. Gave a history of having pain in the region of the right kidney for fifteen months. This pain recurred at irregular intervals of from one to three months and usually lasted several days. A chill accompanied each attack. No pus, blood or "gravel" was seen in the urine until two months before she applied for treatment, when these appeared with painful micturition. More or less distress in the region of the appendix.

Vaginal examination showed a pronounced thickening of the vesical portion of both ureters. On bimanual examination pain was elicited in the deep pelvic region. Urine showed large amounts of pus and blood. Radiograph showed a shadow along the entire line of the pelvic and vesical portions of the right ureter. Near the middle of the pelvic portion, the shadow was intensified. No shadow in the kidney regions. Neither of the ureters could be catheterized because of the engorgement about mouths. Diagnosis: Impacted stone in pelvis of right ureter.

Operation, Sept. 10, 1907. Through a median abdominal incision an impacted phosphatic stone (1.5 cm. in length, 0.75 cm. in thickness, weight 4½ grains) was removed from near the middle of the pelvic portion of the right ureter. After removing the stone, a catheter was passed through the ureteral incision upward to the

kidney and 3½ ounces of thick purulent fluid was drained from the kidney pelvis. The catheter was then passed downward into the bladder. As it met with no obstruction the ureteral incision was closed. The appendix markedly diseased, was removed. Urine drawn from the kidney pelvis showed staphylococci, no tubercular bacilli. The patient made an uneventful recovery.

Eventually, the kidney had to be removed because of a tubercular invasion. This case was reported in full, with illustrations, before the American Gynecological Society, May 26, 1908.

CASE VI.—Miss W., Aged forty-nine. Discomfort in region of right kidney for twelve years. Physical examination ten years ago, previous to the operation to be described showed a large movable, tender, right kidney. There was no stone, but colon bacilli and a considerable amount of pus. Interval pains were noticed during the past ten years and, when examined two years ago, the right kidney was found to be fixed. Urine was practically the same as before. X-ray Jan. 4, 1917, showed multiple stones in the pelvis and parenchyma of the kidney. Operation Jan. 18, 1917, nephrectomy. Kidney pelvis found distended and contained several large stones. One of them fitted closely the ureteral opening. Two or more stones in the kidney structure.

Nephrectasis as the result of calculi in the pelvis of the kidney or ureter is, of course, not infrequent. This case, as the previous one, is used only to illustrate a more or less common type.

A case of spontaneous rupture of the right ureter, due to the presence of a calculus with extravasation in the perirenal area could with interest and profit, be reported in this discussion. Intermittent distention of the pelvis of the kidney probably existed prior to the accident but no history could be secured of interval pains and as the initial distention was probably immediately before the ureteral rupture, this case must be considered an acute with rupture and not an interval type. Dr. F. A. Dorman and myself are to report this case in full at some future time.

I wish to acknowledge the valuable service rendered by Dr. Bugbee of the Urological Department and Dr. Law of the X-ray Department of the Woman's Hospital in this study.

Since the publication of the foregoing article in the April issue of the AMERICAN JOURNAL OF OBSTETRICS, two cases of nephrectasis have come under observation at the Woman's Hospital and are of sufficient interest to here append.

By courtesy of Dr. Geo. Gray Ward, Jr., I relate in brief the history of the following case.

Prior to Dec. 23, 1917, the patient had had several operations performed upon her, but that part of her history which pertains directly to the subject under consideration began on the above date at which time she was taken with a severe pain in the right

kidney region, chill, fever and nausea. Pain was less distressing when she reclined; micturition frequent. She was confined to bed five days. Two weeks later she had a second attack which kept her in bed seven days; after several weeks a third attack occurred. The recumbent position gave her relief. The erect position exaggerated the disturbance. During attacks the right kidney region was always tender. Examination over kidney region during the intervals of attack revealed a markedly mobile right kidney.

The first x-ray photo was taken in recumbent position; catheter in right ureter and kidney pelvis; 24 c.c. of thorium injected in the pelvis.

This picture shows no evidence of the cause of distention. The second photo was taken in a sitting position at a different time and shows an unusual double curve of the right ureter. The curves are so marked that they may be considered true kinks and the probable cause of obstruction to the urine stream. The supporting structure of the ureter was evidently greatly relaxed and in the standing position the ureter assumed a tortuous course as the result. When a ureter prolapses with the kidney, the curves resulting are usually such as to occasion only a minimum degree of obstruction. Polyuria under conditions seen here would be an additional factor in the causation of the kidney pelvis distention. Urine withdrawn from the kidney pelvis showed pus, blood cells, and colon bacilli.

*Diagnosis.*—Pyonephrosis of the right kidney, irregular interval type. Prolapse of kidney.

The case has not yet come to operation.

The second case is under the care of Dr. Hermann Grad, who accurately diagnosed an obscure condition. Since 1917 patient noticed a mass in the cecal region. This mass gradually increased in size, pain was more or less constant in and about it. Palpation showed an irregular fixed tumor extending from the cecal region to the lower border of the twelfth rib, painful on manipulation. Cecum and ascending colon fixed over tumor. Temp. ——. Pulse ——. Blood exam. ——. Urine from right kidney showed pus and blood. Colon bacilli also. She had lost 32 pounds during the past three months.
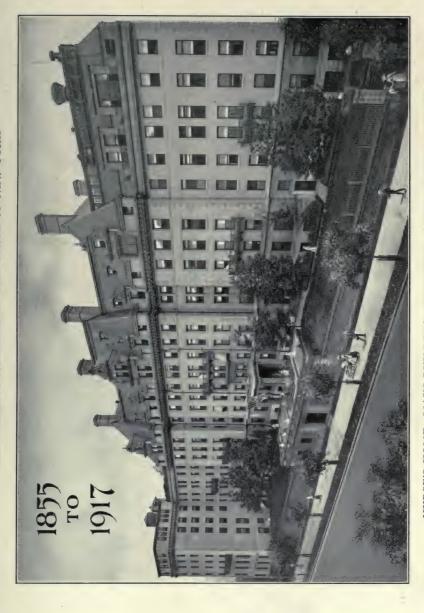
X-ray with catheter in ureter and 20 c.c. of thorium injected in the kidney pelvis, shows a beautiful picture of a distended kidney pelvis and ureter. The ureter is shown to follow a gentle curve in the direction of the vertical column. Had a picture been taken, profile standing, it would have determined whether the tumor mass was intraperitoneal or retroperitoneal, however, the history with the x-ray photo gave sufficient evidence to justify the opinion that the mass was retroperitoneal and was a retrocecal abscess.

Operation April 13, 1918.

A large indurated mass of tissue which contained pus was found posterior to the cecum. The ureter was noted passing over the mass.

The distention of the kidney pelvis in this instance was evidently the result of pressure on the ureter from an indurated and infiltrated

THE WOMAN'S HOSPITAL IN THE STATE OF NEW YORK

1855
TO
1917



NURSE'S HOME—MAIN BUILDING—THOMPSON PATHOLOGICAL BUILDING

mass of cellular tissue which forced the ureter inward and forward. This postfecal mass was probably appendicular in origin and involved the fascial and subfascial tissues. Distention of the kidney pelvis probably occasioned pain, but this pain could not be distinguished from that occasioned by the abscess. The pain was probably irregular in character, varying with the changes in size of the tumor mass. Under these circumstances we are justified in classifying this case as belonging to the irregular interval type.
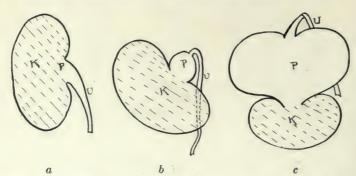
FIG. 1.—A schematic drawing showing the evolution of Case 1 and of Chetwood's case. *a* Shows the kidney and ureter in normal position and condition. *b* Shows kidney prolapsed without a corresponding change in the position of the ureter with resulting angulation and slight distention of the kidney pelvis. *c* Shows a stage of further prolapse of the kidney but no change in position of the ureter with resulting acute angulation of the ureter and marked distention of the kidney pelvis.
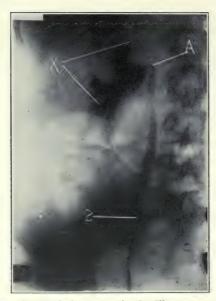


FIG. 2.—(Chetwood's case before operation.) Illustrates a constriction in the upper urinary tract. The kidney here has prolapsed but the ureter has not, and in consequence we have an angulation of the ureter at the point where it fails to descend.[1]

[1] Figs. 2 and 3 are inserted by permission of Dr. Chas. H. Chetwood of New York, published in the *New York Medical Journal*, April 14, 1917.

FIG. 3.—(Chetwood's case after operation.)   Kidney restored to normal position by nephropexy with angulation relieved.
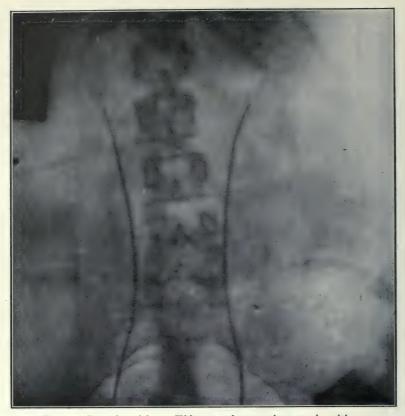
Fig. 4.—Dorsal position.    Kidneys and ureters in normal positions.

Fig. 5.—Study of preceding case in erect position.   On the left side we see the kidney and ureter beginning to prolapse and on the right side the prolapse of both kidney and ureter well advanced.   The right ureter is displaced in front of the spinal column and reaches practically the middle line.   This picture, with the preceding one, gives a good idea of the progressive changes of position of the ureters usually accompanying the descent of the kidneys.
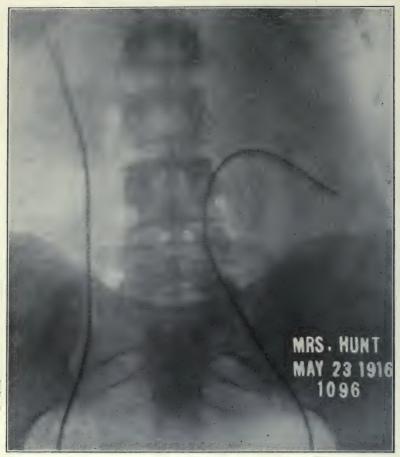
F<small>IG</small>. 6.—Unusual displacement of right kidney and ureter with patient in dorsal position.   Left kidney and ureter practically in normal position.
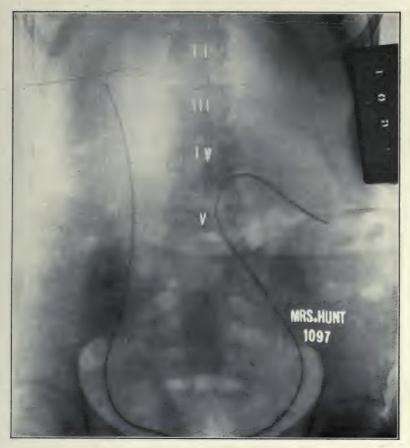
FIG. 7.—Study in upright position of preceding case.   Right kidney and ure-
ter further displaced.   Ureter forced almost to the median line.   The position of
the left kidney and ureter has remained practically the same.

Fig. 8.—Study in profile, upright position of preceding case. Right ureter is seen in front of the vertebral column, showing an apparent angulation which in reality (see Fig. 7) is a pronounced curve.
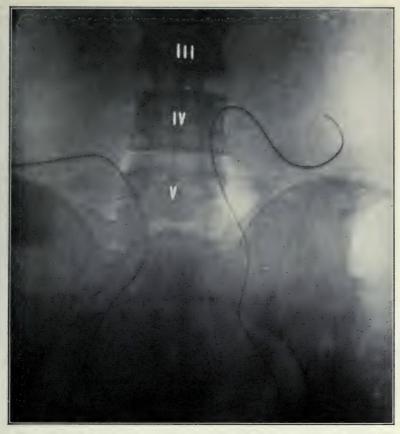
FIG. 9.—Upright position showing an unusual degree of mobility of both kidneys and ureters and demonstrating also how with an abnormally movable kidney the ureter usually follows the descent of the kidney. The entire abdominal portion of both ureters are in this instance remarkably displaced. The left has advanced in front of the sacral promontory, rendering it peculiarly susceptible to pressure after the fourth month of pregnancy.
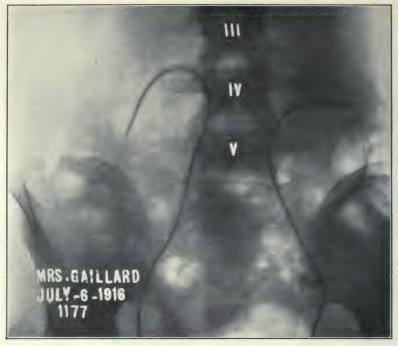
Fig. 10.—Upright position.  Both ureters displaced in front of spinal column.
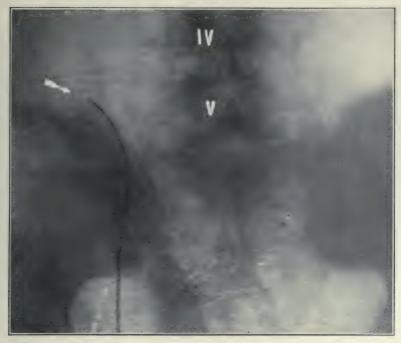
Fig. 11.—(Case II.)   Irregular type of intermittent nephrectasis, the second case reported.   The pressure on the ureter by the distended kidney was such as to prevsnt the catheter being passed beyond  the crest of the ilium.   The course of the ureter is here shown to be away from the vertebral column which is the exception to the rule.
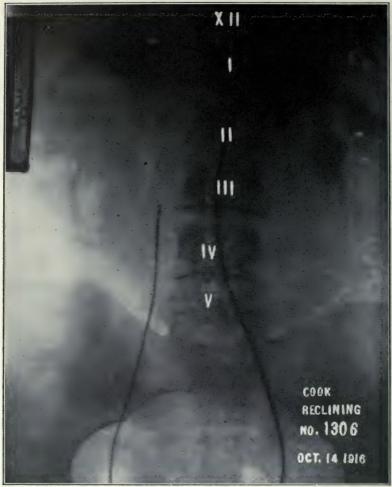
FIG. 12.—(Case III.)   Regular interval type of intermittent nephrectosis.
Dorsal position.   A case combining three interesting features of the right kidney,
namely hydronephrosis, nephrectasis and a large single cyst of kidney paren-
chyma.   The enlargement of the kidney pelvis was probably due to the presence
of a large single cyst which involved the greater portion of the parenchyma and
acted in two ways.   First, the presence of a body sufficiently large to force the
ureter so far out of its normal course must have produced upon the ureter con-
siderable pressure.   In order for a normal amount of urine to flow through such a
ureter the resistance produced by the tumor had to be overcome.   Nature adjusted
herself to the task gradually but at the expense of the kidney pelvis.   Second, the
extremities of the kidney pelvis were found to be so intimately related to the cyst
wall that it was impossible to dissect away the tumor intact without entering the
kidney pelvis.   These two sacs may have been originally in close proximity and
as the cyst grew the wall of the kidney pelvis extended with it.   The entire
abdominal portion of the right ureter is here deflected to a position in front of the
spinal column.   Such a deflection of the ureter with the kidney in practically
normal position suggests the presence and the influence of a retroperitoneal tumor.
The outlines of a distended kidney pelvis can be distinctly seen.   25 c.c. of thor-
ium injected into the kidney pelvis occasioned the same character of pain as was
experienced during interval attacks.
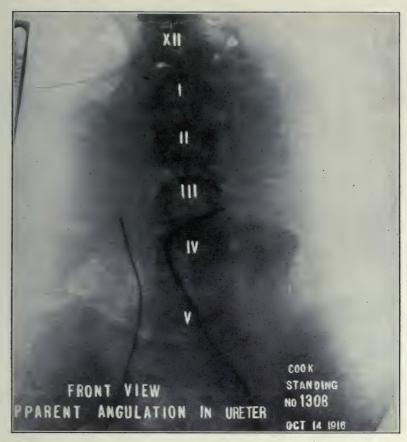
FIG. 13.—Study in upright position of Case No. III. An extreme degree of abnormal mobility of the right kidney and ureter. The range of mobility of the kidney is seen to be from the first to the fourth lumbar vertebra. The kidney pelvis is seen horizontal. The ureter has descended with the kidney and has been forced almost completely across the spinal column. After removing the large single cyst of the kidney the organ was fixed. Patient cured. If such a case occurred in a woman during the childbearing period and the cyst removed but the kidney not fixed, the hydronephrosis would continue to be a source of distress, and the ureter (patient in upright position) might assume practically the same abnormal position in front of the spinal column as is here seen. Under these circumstances the ureter would be exposed to the danger of pressure from the pregnant uterus.

FIG. 14.—(Case III).  Profile study in upright position.  The right kidney is here shown well forward and opposite the fourth lumbar vertebra and the sharp curve seen in Fig. 13.  A front view study of the same case is here transformed into a gentle curve with a forward direction.  Incidentally the ureter of the left side is seen in contrast to be posterior to the vertical plane passed immediately in front of the spinal column.

FIG. 15.—(Case IV).   The irregular interval type of intermittent nephrec-
tosis.   Dorsal position.   Pyonephrosis of the right kidney with considerable
distention of the kidney pelvis.   30 c.c. of thorium injected into the pelvis
occasioned the same character of pain as was experienced during the interval
attacks..   There is marked irregularity of the upper portion of the ureter, beyond
which the catheter could not pass.   Beyond the tip of the catheter there is a
deficiency shadow, suggestive of a sudden change posteriorly in the direction of
this portion of the ureter and a lessening of its calibre.   This change in direction
is probably the result of fixation of a limited area of surrounding cellular tissue
which lost its elasticity as the result of pyonephritis or pyelonephritis.
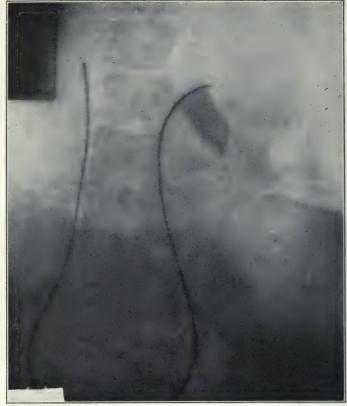
FIG. 16.—*X*-ray picture of patient (Case IV) in erect position with 8 c.c. of thorium injected into kidney pelvis.    Kidney in a lower position than in Fig. 15. Catheter has passed the constriction.

FIG. 17.—(Case IV).   X-ray of kidney out of the body showing the degree of normal capacity of the kidney pelvis (30 c.c.) and area of constriction at juncture of ureter and of kidney pelvis.
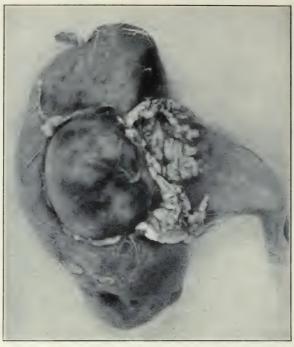
FIG. 18.—(Case IV).  Shows the posterior surface of the kidney on which is seen a tumor containing pus and a phosphatic concretion.  This tumor was an arrested tubercular process.  In the pelvis of the kidney there was imbedded a second phosphatic concretion.  In the parenchyma of the upper pole an active tuberculous process was discovered.  The outlines of the pelvis and the upper portion of the ureter in this photograph are as when the organ was removed from the body and show the angulation at the juncture of the ureter and the distended pelvis.

FIG. 19.—(Case VI).   Irregular interval type.   The distention of the kidney pelvis is here due to stone partially obstructing the flow of urine.   Kidney is fixed as the result of an inflammatory process.

FIG. 20.—Dr. Ward's case, pyonephrosis, irregular interval type, prolapsed right kidney.   Photo taken in recumbent position.   24 c.c. of thorium in kidney pelvis.   Outline of pelvis and ureter not distinct because patient breathed at time picture was taken.

FIG. 21.—Same case. Photo taken at a different time, sitting position, no thorium injected. Catheter failed to enter kidney pelvis and was obstructed at a point near the pelvis. A profile study was made in standing position, photo omitted here, gave additional evidence that the cause of the obstruction to the urine stream was the several kinks in the ureter.

FIG. 22.—Dr. Grad's case of pyonephrosis; irregular interval type. Photo taken in recumbent position; 20 c.c. of thorium injected in the pelvis of the kidney. Ureter displaced inward and forward by a retro-caecal mass, the resulting post-pressure on a considerable portion of the ureter was the probable cause of obstruction to the urine stream. Polyuria would here also be an additional factor in the causation of distention of the kidney pelvis.

# HYPERNEPHROMA OF THE KIDNEY.

BY

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(With three illustrations.)

HYPERNEPHROMATA have in general such striking characteristics that a recent case is here reported to analyze some of their features. The patient, a married woman of forty-three years, entered the Woman's Hospital on the service of Dr. Pinkham early in October, 1917. Somewhat over a year previously her attention had been attracted by a pain in the left abdomen, most noticeable on walking. Subsequently she had noticed a mass in this region but this had caused her no anxiety until the last six weeks, in which time it had increased considerably in size. She had recently lost much weight and strength.

According to her own statement there had been some signs of heightened sexual feelings, which she noticed during the growth of this tumor. Upon physical examination an indefinite mass was felt in the lower abdomen, extending into the pelvis. At the operation it was evident that the tumor involved the kidney and that it was located at the lower renal pole. The kidney itself was felt to be in the normal location; its upper margin was under the ribs, and no tumor was associated with that portion. The adrenal gland was not observed and it may be inferred that it was not enlarged. The colon lay to the outer side of the tumor, which extended into the pelvis. The ureter and renal vessels were ligated close to the pelvis and the tumor and kidney removed *en bloc*.

The kidney, with tumor, measures 19 × 9 × 6 cm. The tumor is entirely within the capsule of the kidney, occupies one pole, the lower, and is 9 × 9 × 6 cm. in diameter. It appears largely cystic. The ureter and vessels are cut off close to the pelvis, so that their direction cannot be ascertained. One or two discrete nodules of tumor are seen beneath the capsule, apparently in the cortex of the kidney (Fig. 1).

On section the kidney appears normal in its upper half. The capsule peels smoothly, the pyramids and cortex appear normal. The kidney substance thins out over the tumor at the lower pole, suggesting that the latter originated in the pelvis, had greatly dilated this and had replaced all but a shell of the kidney tissue in its lower half. The main portion of the tumor is a hemorrhagic cyst; its solid parts consist of a yellowish, friable, cellular tissue divided into globular masses. Sections from the transitional areas and from the tumor mass were taken in Zenker's fluid, formalin and for frozen sections. The latter when stained with Schalarch R. gives a copious fat reaction in the cells of the tumor itself. No glycogen was demonstrable microscopically.

One section shows renal tissue with hyperemic glomeruli. The collecting tubules in certain regions contain casts. Section of the tumor proper shows a uniform type of cells which are large, with small central nuclei and a large amount of faintly staining protoplasm. The cells contain large fat globules. These cells are arranged in strands of 3 to 4 cells wide, bounded by very delicate connective-tissue septa. These strands are indefinite and sometimes bound polyhedral aggregates of cells. A large number of capillaries run between these cell masses; these show no endothelial lining, and their walls are no more than the delicate connective tissue seen in the septa or else formed by the specific cells of the tumor. There are also a small number of epithelial cells with a smaller amount of protoplasm which contain no fat. These occur in the form of small islands.

The characteristic large, pale, fat-containing cells, arranged in somewhat fasciculated form, with a minimal amount of connective tissue, and the thin-walled capillaries determine the tumor to be a hypernephroma.

The transitional areas show a very dense and broad connective-tissue band separating the tumor from the atrophic kidney substance. This band appears to have arisen from atrophy of the renal elements, and the tumor appears to be inside the capsule of the kidney and to have an origin in the pelvis. There are metastatic nodules in the broad connective-tissue septum, but at no place is there direct extension of the tumor into the renal parenchyma.

From its location at the lower pole, its origin in the pelvis and its enclosure within the capsule of the kidney the conclusion may be drawn that this is a hypernephroma arising from an accessory adrenal and not from the normally situated left adrenal (Fig. 2).

It is possible that the normally situated adrenal is the site of a

primary adrenal tumor from which this is a metastasis, but this is very unlikely from the operative findings.

Accessory adrenals are not uncommon, and there is a definite embryological explanation for their occurrence. Of the two tissues making the adrenal the cortex may be regarded as the true or original tissue, since it develops as a ridge of cells from the celom epithelium.

The chromaffin tissue, which forms the medulla, is really a foreign ingrowth, as is seen in batrachians where the two occur as separate structures.

The immigration of these sympathochromaffin cells produces a cleavage of the surface of the adrenal, as a result of which there may be a separation of greater or smaller portions of the gland.

The accessory suprarenals either remain in the vicinity of the principal gland, or they may eventually be situated far away, if they become associated with organs that alter their position. Common sites are on the spermatic vessels, ligamentum latum, epididymis and epoöphoron. An instance of the latter site was found in a tumor less than a millimeter in diameter in the mesosalpinx of a case of salpingitis operated at the Woman's Hospital (Fig. 3).

The accessory glands consist for the most part of cortical substance only, yet the fact that they occasionally also contain medullary substance, shows that their separation is frequently due to the sympathochromaffin tissue. Another cause of accessory glands is the separation of cortical portions, which form nodular projections on the surface of the adrenal. They are not adenomata though they have been so regarded.

In looking over the literature of hypernephromata it is quite evident from the description that many if not most of them are tumors of accessory adrenals as is the present case. It would seem plausible to expect that heterotopia would have a relationship to tumor formation, though the actual cause is obscure.

A normally situated suprarenal gland may have accessory portions on its surface or interior, and these may form hypernephromata or may remain quiescent. It appears altogether probable that most hypernephromata are derived from aberrant or accessory glands and not from otherwise normal adrenals. The classification of these tumors has given rise to some discussion in the past, due to the fact that some writers regarded them as of renal rather than adrenal origin. This was due to their frequent location in the kidney, but this is now explained as a heterotopic process. As to their histology they present the picture of an exaggerated adrenal tissue which is to be expected from their hyperplasia.

Microchemically they show glycogen and lipoids as do the adrenals themselves, while finally they produce at times the same physiological effect as the internal secretion of the adrenal cortex.

The term hypernephroma seems quite satisfactory for these tumors and replaces the older designation of adenoma. It is quite evident that the suprarenal is a gland of internal secretion and that it does not form glandular lumena from which an adenoma might arise. Its outer layer is termed glomerular because the cells there are arranged in somewhat globular form and not in columns as in the fascicular zone. These globular masses may have spaces in their centers and this form appears sometimes in the hypernephromata.

This has given rise to the use of the term adenoma which might better be restricted to true glands. The difference is plain when one considers that in true glandular tumors the first stages are always tubular, adenomata, with a later appearance of solid masses, while in the suprarenal tumors the first appearance is the solid cords with a late simulation of a glandular structure. Another mistaken idea was to consider these spaces indicative of an endothelioma, since they often contained blood. The capillaries of the suprarenal are very delicate and blood will readily fill such spaces. The cells composing the walls are but the characteristic hypernephroma cells. The hypernephroma cell represents a greatly exaggerated suprarenal cell, as is to be expected from the hyperplasia.

The second particular of interest in hypernephromata lies in the peculiar physiological effect that they sometimes produce. In this case it was no more than suggested by an unexpected and unsought statement on the part of the patient about her sexual activities.

But the literature of hypernephromata affords some very striking cases of sexual precocity or heightened activity.

These are very interesting evidences of hormone formation by neoplasms of ductless glands, other instances of which are seen in the gigantism occurring in tumors of the pituitary.

In general, tumors are functionless, but if the cells of glandular tumors preserve their differentiation they may secrete to an enormous degree.

The hypernephromata often appear only as hypertrophies of histologically normal suprarenal tissue, so that it is not surprising that their secretion should be hyperactive. Just as the adrenal medulla is absent in these tumors so adrenalin is not evident in any heightened action, but the effects that so occur are such as would be expected from the cortical hormone, that is, exaggerated secondary sexual characteristics.

The internal secretion of the adrenal cortex is regarded as quite analogous to that of the pituitary anterior lobe.

The corpus luteum is another gland which may be grouped with the adrenal and pituitary on account of the internal secretion which affects the sexual life. Here also there are large pale cells secreting an abundant quantity of lipoids. It has been suggested that the adrenal is derived from celom epithelium as is also the ovary, and that this explains the relationship between adrenal and corpus luteum. But many other unrelated structures have a similar origin. There are no neoplasms of the corpus luteum, with the exception of simple cysts and the lutein cysts of chorionepitheliomata, and no disturbances of function occur in these.

There have been some instances of teratomata with precocious sexual development, and one instance of a teratoma in a man, associated with lactation.

Teratomata are regarded as tumors of blastomeres. The origin of the sexual stimulus in these cases is problematical, although it is probable that the normal fertilized ovum does in some way influence pregnancy.
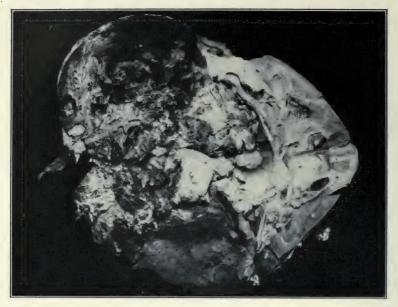
FIG. 1.—Hypernephroma of kidney.



FIG. 2.—Columns of cells in hypernephroma.
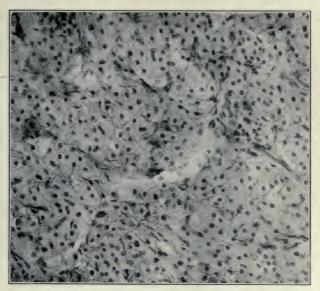
FIG. 3.—Aberrant suprarenal in mesosalpinx.

# PERFORATION OF THE VAGINA BY A PAPILLARY CYST OF THE OVARY.

BY

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(With two illustrations.)

PAPILLARY cystomas of the ovary, while not rare, are encountered but infrequently, and are, therefore, looked upon with interest by every operator. When carcinomatous processes are found with the papillations the surgeon's interest, from a prognostic point of view becomes keener. Perforation of a hollow viscus by such a tumor, according to the literature, is very rare, and, therefore, a record is here made of this case of perforation of the vagina by a papillary cyst of the ovary.

The case is unique in my experience. A diagnosis of a cervical carcinoma was made but the error rectified at the second examination, as the cervix was shown to be free from disease. The neoplastic mass filling the vagina was seen to be situated behind the cervix, having its origin on the vaginal wall in the region of the cul-de-sac of Douglas. The nature of the new-growth was not clear at that time and, as the subsequent history of the case developed, its true nature could not have been surmised.

Tumors of the ovary have always been looked upon by clinicians as benign neoplasms. When associated with papillomatous growths or when papillomas have invaded the cavity of the cystoma, they have been viewed with suspicion and by some surgeons have been classed as positively malignant tumors. The reason for this is the clinical fact that like carcinoma, papillary cystadenomas may cause ascitis, they are often bilateral and like carcinoma may become disseminated over extensive peritoneal surfaces, in the form of cauliflower excrescences. Both may be accompanied by a degree of malnutrition and emaciation difficult to differentiate from true cachexia. Positive proof that simple papillary cystadenoma are

not malignant, is furnished by the fact, which is attested to by many surgeons of experience, that the removal of these tumors is followed by a complete and permanent recovery, notwithstanding that at the time of the operation there was ascites present and numerous points of metastases on the intestines and other portions of the peritoneal cavity. This is in contradistinction to carcinomatous metastases, for these preserve their destructive tendencies whether the original tumor is removed or not. Pfannenstiel has shown after a careful study of the subject, that papillary ovarian cysts are benign neoplasms, their growth is slow though progressive, a destructive tendency of the implantations is lacking, they do not give rise to true cachexia even in the advanced forms and they do not recur after a radical removal by operation.

*Types of Tumor.*—Ovarian growths with papillations, while presenting a group of neoplasms which clinically are well defined and have many characteristics which are peculiar to them, cannot be placed in a class by themselves. Pathological studies have shown that different kinds of ovarian neoplasms may have papillary growths on their surface or on the wall inside of the cavity. They are, therefore, not a type of tumors peculiar to themselves. A serous cyst of the ovary either small or large, may have papillations on its surface or inside the cavity. The same is true of the pseudomucinous cysts of the ovary. This fact alone will not permit the classification of these tumors by themselves and, although many authors have attempted to do this, the classification has fallen down upon this very point, namely: papillations may be found on both kinds of ovarian cystomas.

The number of papillations that are encountered on ovarian cyst, is extremely variable. In some cases the papillations are very few, merely a few excrescences here and there, while in others the papillating masses are larger than a grapefruit, or they may be so massive as to fill the abdominal cavity. This holds true for both, whether on the surface of the tumor or inside the cavity. Olshausen has shown that the larger the ovarian tumor, the smaller the number of the papillations. In the very large tumors the papillations may be very scanty and are more likely to be at the hilum of the ovary rather than on the free border.

*Histology.*—Papillary growths of the ovary are very interesting histologically. The excrescences consist of connective tissue covered by epithelium. The connective tissue, however, forms only the framework upon which the epithelium rests. In other words the whole growth consists of epithelial cells but the cells are arranged

in a definite plan upon a framework of connective tissue, which carries the blood and lymph vessels. These papillary growths are very vascular. An examination of the earliest stages of these growths shows that they consist of an astounding degree of proliferating epithelial cells. As these cells multiply they push forward, bringing with them a basement layer of connective tissue. In this manner they form branches, which again rebranch and thus as it were a tree is formed. On account of the histogenesis, these tumors might be termed papillary epitheliomas, the latter term, however, is associated with carcinoma and, therefore, the term papillary adenoma was given to them because a microscopic cross-section resembles glandular structure.

The color of the papillations is as a rule reddish, but may shade off into a grayish tint. The variations are due to hemorrhages into the substance of the tumor or to necrosis. In some places one can observe yellow stains on the surface of the tumor due to fatty degeneration. Very frequently one sees calcareous deposits on the surface of the papillations, the so-called 'psammon bodies.' These bodies are not the result of a degenerative process, but are a part of the so to say 'biologic process' of the papillary formations. These bodies must not be mistaken for the calcareous incrustations found on the papillary masses that have undergone necrosis.

It is of interest to note here that on account of the frequency with which calcareous incrustations are found in papillary adenocarcinoma of the ovary, these calcareous masses have been looked upon with suspicion, as they may be related in some way to carcinoma of the ovary. Some authors have gone so far as to name these neoplasms psammocarcinoma. This is certainly not the case and it would be an error to so classify them, for such a classification may lead to harm in adopting or failing to adopt proper and effective therapeutic measures. There are benign papillary growths of the ovary with calcareous masses and there are malignant papillary growths with calcareous incrustations, but one pathological state has nothing to do with the other.

The papillations found on various types of ovarian tumors are the result of a biologic process which is apart from that of the cystoma upon which they develop. The papillations are the result of an extraordinary tendency of the surface epithelium to proliferate. On account of this tendency, the cell-production becomes enormous, every available space is filled up, nor is the cavity of the neoplasm spared from invasions. The cavity of the tumor may become soon filled with larger masses of proliferating cells and, on account of lack

of space, the cells begin to suffer various degenerating processes. They become flattened, undergo necrosis, fatty degeneration, calcareous changes, etc.

In some papillary tumors the connective tissue cells, the basement cells upon which rests the epithelial cells, show a marked tendency to proliferate. The result is a papillary tumor which is firmer in consistency than the type of papillary tumor in which the epithelial cells predominate.

There has been a great difference of opinion among writers as to the frequency with which the carcinomatous processes that are found in cystomata of the ovary are of primary development or are the result of a carcinomatous degeneration. If under 'carcinomatous degeneration,' we understand cases where fully developed adenocystomas after years change their character and become carcinomatous, then the cases conforming to this view have been very few and far between. There are ever so many cases on record of fully developed adenocystomas of the ovary that have existed for many years in women advanced in years, that have become of enormous size and yet on their removal have shown no carcinomatous changes. On the other hand, there are small ovarian cysts that have been known to have existed but a short time, where adenocarcinoma is found and the cancerous process must have developed coincidently with the cystoma. It is therefore essential to keep these two pictures separate. Primary carcinoma in a cystadenoma of the ovary and carcinomatous degeneration are two distinct conditions; one has nothing to do with the other. If a carcinomatous change of a comparatively early date is found in a fully developed cystadenoma, then it is clear that 'carcinomatous degeneration' has taken place; this, however, is not often found. Cystcarcinomas are far more frequently encountered, where the cancer cells are found in widely scattered places of the tumor. It is clear that in these cases the cancer developed primarily.

*Implantations.*—The ovaries being intraperitoneal organs, when they become invaded by papillary new-growths, the peritoneum may become involved by implantation. Small papillary particles of tumor are detached, find lodgement on and become nourished by the peritoneum. Cells may become detached spontaneously or may break away through traumatism and are implanted on the peritoneal surface. In this newly situated location the cells proliferate, developing into new tumor masses, similar to the mother tumor. The peritoneum of the pelvis is first invaded, but by the peristaltic action of the intestines, cell particles may be carried to any part of

the peritoneal cavity and become implanted, not excluding even the diaphragm. Cell particles of the tumor may also be sucked through the stomata of the diaphragm and become implanted on its pleural surface. By a process of active proliferation, tumor cells may grow into lymph spaces or stomata from which lymph vessels take their origin. By the lymph current the cells are carried to the nearest lymph node in which a tumor may develop or the tumor cells may be swept into the general circulation and thus metastases may occur in any part of the body. Metastases in this manner of tumor cells of the ovary is, however, extremely rare.

*Relation Between Papilloma and Carcinoma.*—On account of this tendency to implantation of papillary tumors of the ovary, the suspicion has arisen that perhaps in some way they are related to the malignant neoplasms. There is, however, a great difference between the implantation of a papillary cell and that of a cell endowed with malignant tendencies. The cell of a papillary cystadenoma may proliferate on the newly implanted situation to an enormous degree, but will not cause destruction of neighboring cells. This is the great difference between a cancer cell and a papillary cell. It is immaterial how the cell from the mother tumor reaches its new situation, whether by peristaltic action of the intestines, by contact alone, by the lymph or blood stream. When the cell finds sufficient nutrition in its new place and does not perish, it will proliferate and develop into a tumor mass, but it will not destroy neighboring cells. It may also happen that after a certain stage of development, further growth of the metastatic mass ceases or the growth may entirely disappear by absorption. Cancer cells do not behave in this manner. The destructive tendency of the cancer cell is the same in the metatases as in the parent cell.

Attention must, however, be called to the fact that not all papillary implantations behave in the benign manner alluded to above. In a large number of cases they react in a very harmful fashion toward the organism and in a certain number of instances they are the direct cause of death. In some cases the implantations become so extensive and are so situated that they cannot be removed. Complications may arise, and the exhaustion of the patient finally terminates in death. Cases have been recorded where the papillary tumor of the ovary was of the benign type and the implantation proved to be a malignant degeneration or the process was malignant from the beginning. It has not been proven thus far whether these secondary malignant degenerations of implantations are frequent or infrequent.

*Ascites.*—Ascites is a frequent complication of ovarian tumors, and is often encountered with the papillary cysts. It has been computed that ascites occurs in about 27 per cent. of cases. If the neoplasm throws off irritant products into the peritoneal cavity, the peritoneum will react toward it by transudation and an ascites will develop. If a cyst ruptures and its contents escape into the peritoneal cavity, the fluid may be absorbed without awakening a peritoneal reaction. In other cases, however, the escape of cyst contents causes a peritoneal reaction with a resultant ascites. In some cases the quantity of the ascitic fluid is very small, in others it is considerable. If the escape of the cyst contents extends over a long period of time, the resultant peritoneal reaction will be in proportion. The ascites is most marked in those cases where peritoneal implantation has taken place, for here the peritoneal irritation is necessarily greater and the cell secretion of the implantated mass is an added factor in the formation of the ascites. In other cases the ascites is due not alone to a transudation but to a peritoneal exudation. Here there is likewise an inflammatory reaction of the peritoneum, brought about by a complication of infection of the neoplasm itself, such as by tuberculosis. Sometimes there is not only an ascites present but also a pleural effusion. In these cases the quantity of the fluid in the peritoneum is so great that the pleural cavity becomes filled by suction through the stomata, although not all of the elements of the fluid in the abdomen are found in the pleura.

The clinical significance of ascites and pleural effusions cannot be stated in clear terms, they are very variable. But it can be stated that the presence of even a considerable degree of ascites does not necessarily mean a malignant disease of the ovary. With the removal of the tumor the ascites also disappears even though the implantations on the peritoneum is considerable. With the malignant tumors of the ovary, ascites occurs in about 64 per cent. of cases, in the benign cases in about 18 per cent., while in the fibromas of the ovary ascites occurs in 72 per cent. of the cases.

*Contents of Cysts.*—Papillary cystcarcinomas of the ovary, that is to say papillary cystadenomas, where a carcinomatous process is also present, are histologically the same as the cystadenomas, but do not attain the same size. As a rule they are much smaller, although they may become the size of a man's head. The contents are a serous fluid, quite clear but more often clouded by the presence of a large number of pus cells. If a hemorrhage has occurred, the contents may be mixed with blood, giving the fluid a brownish color. In the walls of the cyst, as well as in the septum

of the various compartments of the tumor, there occur solid knots
and solid plate-like masses, of various sizes and shapes, similar in
appearance to the medullary carcinomas anywhere else in the body.
In about 50 per cent. of the cases where papillary cell proliferations
are also found in a cystadenoma of the ovary, carcinomatous process
will also be encountered. In appearance the papillary formation
in the cystcarcinomas is the same as in the papillary cystadenomas.
When, however, the tumor mass is cut across, even with the naked
eye the carcinomatous character of the tumor will become apparent.
The cut surface of the growth yields a milky fluid and the knotty
character of the tumor becomes visible. These solid knots occa-
sionally are so large as to form half of the tumor. Part of the tumor
may be a cystadenoma while the other part a true adenocarcinoma.
If one finds a small area of a carcinomatous process n an apparently
old cystoma, one can consider the case as a secondary carcinomatous
degeneration of a cystadenoma. If, however, the cystoma is of
recent development with many cancer areas, one must consider the
process as a primary adenocarcinoma in conjunction with the adeno-
cystoma with or without papillary proliferation. Both the adenoma
and adenocarcinoma develop from the same type of epithelial
cells, a gland-like epithelial cell in an undifferentiated state. When
the change occurs in the cell, one cannot say whether it is to be an
adenoma or a carcinoma. If the cell remains typical and does not
change as to size and function, an adenoma will develop. If the
cell changes, becomes atypical as to size and appearance and
function, then a carcinoma will develop. Both growths, the
adenoma and the carcinoma, stand in the same relation as to their
development and therefore it is not difficult to understand that both
types of tumors may be found in the same neoplasm.

*Prognosis.*—As already cited, the ultimate outcome of a case of
papillary cystadenoma is difficult to prognosticate. Experience
has shown that the simple papillary cysts are benign, but it is almost
impossible to know with certainty that the papillary cyst is a simple
one. A very large number of these papillary cysts have a car-
cinomatous process going on in the same growth. What holds good
for the tumor, is also true for the implantations. In one area the
implantation may be of the simple papillary form, while in the other
it is the carcinomatous form. In the papillary form, when the
mother tumor is removed, the implantations as a rule disappear
after the operation, or if the implantations do not disintegrate their
development is so slow that the patient remains well for many many
years. Not so with the carcinomatous implantations. Here the

destructive tendency of the proliferating cells dominates the situation. The cells invade other organs causing more or less destruction in them. Hollow organs become invaded, the cancer breaks into them, bringing about serious complications.

In the case reported here, a very rare complication occurred. The cancerous proliferation broke into the vagina, by way of the cul-de-sac of Douglas. Large masses of cauliflower growths appeared in the vagina, interfering with the diagnosis of the case.

*History.*—When Mrs. J. J. came to my office to consult me about herself, she said that her chief complaint was a bloody vaginal discharge for the past six months. At first the bleeding only took place after a douche or intercourse. In the later dates, however, the bleeding had been continuous, never much, but a more or less constant staining. There was a dragging sensation in the pelvic region with occasional shooting pains in the lower part of the abdomen. The patient is thirty-five years old and has been married six years. She has had no children and no miscarriages. Her family history is negative as to cancer and tuberculosis.

She has been perfectly well in every way except that three years ago she had an attack of malarial fever. One year ago she had a mild attack of muscular rheumatism. She had been subject to a yellow vaginal discharge but it has never been excessive in amount.

Menstruation began at the age of fifteen, was regular every month, scant in amount and with no pain. The flow lasted from two to three days. Her last period was on Oct. 2, 1917, and it lasted three days.

Patient never suffered any abdominal pain, her general health has been very good, appetite poor, bowels constipated. She has no urinary disturbance, but says that she is conscious of an enlargement in the lower part of her abdomen. She does not know how long she has observed this enlargement, but it has been for some time. She has not lost in weight. Does not think that the loss of blood has affected her in any way. She seeks relief because she is annoyed by having to wear a napkin all the time. There has been no odor to the vaginal discharge. There has been no backache or headache. She is not nervous and as a rule she sleeps well all night. There has been no gastrointestinal disturbance except that she is constipated. The patient looks somewhat anemic, but the conjunctivæ are normal. Nothing abnormal about the heart and lungs. Abdominal palpation is negative as to the gall-bladder and appendix. Palpation in the left lower quadrant of the abdomen elicits a certain amount of tenderness and an indefinite mass which extends down to the symphyses pubes.

In making a vaginal examination the examining finger encounters a soft mass in the vagina which bleeds quite freely. Even gentle manipulations of the finger resulted in the breaking off of a piece of friable tissue. This piece of tissue was red in color and very soft. The entire vagina is filled with this soft, pultaceous mass, which bleeds freely. On account of the bleeding no further attempt was

made to examine the patient and she was referred to the hospital at once. A tentative diagnosis of carcinoma of the cervix was made. When she entered the hospital several days later, further examination showed that the cervix of the uterus was not the seat of the neoplasm in the vagina. The cervix was normal, but immediately behind it the vaginal wall felt rough. With the patient in the knee-chest position, inspection showed that the growth in the vagina sprang from the vaginal wall at the region of the cul-de-sac of Douglas.

Bimanually a large mass is felt in the pelvis which seems to be connected with the uterus. The tumor in the pelvis extends toward the left of the uterus, in which the ovary is also involved. The right ovary appears to be enlarged. The entire pelvis is tender to touch. The case appeared to me to be malignant but it never dawned upon me to associate the tumor in the vagina with the neoplasm of the ovary. I have never met with a similar case before, nor have I ever read of one. The papillary cystadenoma of the left ovary, with carcinomatous process going on in the same tumor, became implanted on the vaginal wall in the cul-de-sac of Douglas, the neoplasm finally perforating the wall by the destructive tendency of the cancer cell. Proliferation of the cells of the neoplasm progressed, the vagina becoming filled with a large cauliflower excrescence. While the malignant nature of growth in the vagina was recognized it was not associated with the tumor in the pelvis, but the relation was recognized soon after the operation began.

*Operation.*—The patient, anesthetized, was placed in a lithotomy position. The perineum and vagina divulsed and a Percy watercooled speculum introduced. The cauliflower mass removed with forceps and attempt made to curet the base of the neoplasm, preliminary to cauterization with the Percy cautery. In doing this the curet slipped into the pelvis, and at once a large quantity of clear serous fluid escaped through the perforation thus made. It was very evident that I had punctured an ovarian cyst. The relation of the two growths, one in the vagina and one in the pelvis, was recognized and the true diagnosis of the pathologic condition established.

The vaginal vault was thoroughly cauterized with the cautery and the patient placed in position for laparotomy. The abdomen opened in the midline below the umbilicus. On opening the peritoneal cavity, a small amount of ascitic fluid escaped. The peritoneum was studded with papillomatous masses, particularly the pelvic portion. The pelvis appeared to be filled with the mass. The omentum was firmly adherent to the uterus and also to the bladder, and was the seat of a large amount of papillations. After separating the omentum, the sigmoid colon came into view. It was adherent to the structures beneath it and was also the seat of many papillary implantations. After separating the sigmoid from its bed of adhesions and packing it away with gauze, it was seen that the true pelvis was occupied by a papillary tumor of the left ovary and with numerous implantations of the peritoneum. Several handfuls of this papillary mass was scooped out and the pelvis partially cleared. The bladder wall as well as the rectum were the seat of numerous

papillary masses. Both tubes were diseased and distended with pus. The wall of the papillary cyst was collapsed in the pelvis. The right ovary also had a papillary growth on its surface. The adhesions of the pus tubes to the peritoneum were very dense and separated with great difficulty. The uterine body itself was invaded by the growth. It was deemed best to do a total ablation.

The infundibulopelvic ligament and round ligament on the right side were clamped off and cut away. The bleeding points picked up with forceps and the vessels tied with catgut. The same procedure followed on the left side. The bladder peritoneum separated from the anterior surface of the uterus. The parametrial tissue and uterine arteries tied and cut away from the uterus on both sides. The bladder was then mobilized and the vagina cut away from the cervix throughout its entire circumference. The uterus and cervix, both tubes and both ovaries were thus removed in one mass. The vault of the vagina was sutured with catgut, all bleeding points tied and the abdomen closed without drainage.

There was considerable shock following the operation, but otherwise the patient recovered without an incident. The abdominal incision healed by primary union, the vault of the vagina healed by granulations, and the patient so far, has remained well. It is not to be expected, however, that there should be no recurrence in a case of this kind. It may not take place for a long time, however, as it is well known that the development of these tumors is very slow.

The pathological report of the case is as follows:

*Macroscopical.*—Uterus with both adnexa. Uterus measures $9 \times 5 \times 4$ cm. Cervix shows a cauterized roughened area on the squamosa. The parametrium shows a number of friable pieces of tissue attached to the side of the uterus. The uterine mucosa is largely pale, extremely hyperplastic and grooved in many directions, One ovary contains a large corpus luteum with a gray center. A large number of pieces of yellowish broken-down tissue were received separately, also the ovary of the other side with a few small cysts containing masses of the above described type. The serous cyst contains numerous cholesterin crystals. Sections from both ovaries. tumor mass, uterine mucosa and cervix.

*Microscopical.*—Section of the tumor mass shows a mesh work of connective tissue, in the spaces of which are very numerous papillations of epithelial cells, supported by a minute amount of stroma. The papillæ are only two or three cells in breadth. The cells are large and loosely attached to the walls. There are numerous calcareous concretions. Psammomata. This tumor invades the edge of the section of the cervix, the parametrium, and appears in a small nodule in the second ovary.

*Diagnosis.*—Carcinoma ovarii papillari bilaterale. Metastatic in parametrial tissue. Psammoma.
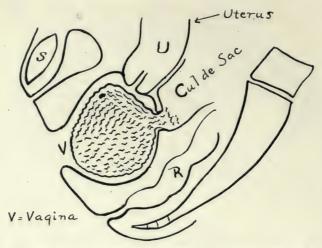
FIG. 1.—Diagrammatic section of pelvis showing invasion of vagina by tumor perforating through cul-de-sac.



FIG. 2.—Diagram showing location of tumor viewed through laparotomy wound.

# ON A CASE OF UTERUS BICORNIS WITH RUDIMENTARY HEMIATRETIC HORN.

BY

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(With five illustrations.)

MALFORMATIONS of the uterus are of such frequent occurrence that every contribution to this chapter of pathology deserves proper consideration in regard to the morphology of the case as well as to its explanation. The case to be described below is an anomaly which, on account of the difficulty of its classification required a rather extensive search for similar cases in the literature. I shall first give an abridged history and anatomical description accompanied.

Mrs. I. S. Path. No. 14214. Attending Surgeon, Dr. Dougal Bissell. Patient is nullipara. She started to complain of pains in the right side nine months before operation (three months before marriage). There was also pain during intercourse and increased menstrual flow during the last six months.

At the laparotomy an ovarian cyst was found and a tumor in the region of the right tube corner. Both were removed without difficulty. The patient made an uneventful recovery.

The pathological specimen shows a cyst of the ovary, 6 cm. in diameter with serous contents. A portion of the other ovary is of normal appearance.

A globular tumor (Fig. 1) of 3 cm. diameter has a stout, very short pedicle which apparently was attached to the uterus in the region of the round ligament. On section, one notices an irregular cavity of 2 cm. diameter, filled with grumous inspissated blood (Fig. 2). The inner lining of the cavity which appears to have no communication with the surface is a corrugated yellowish mucosa. The wall of the cystic body measures from 4 to 6 mm. in thickness and is apparently composed of smooth musculature.

*Microscopical Description.*—Sections of the wall of the tumor show bundles of regularly arranged musculature. Certain bundles are

cut transversely, others longitudinally (Fig. 5). A high columnar epithelium lines the cyst cavity and sends tubular glands into the inner muscular coat. Certain glandular lumina located in the same place show the same type and arrangement of the epithelium as the ones described above (Fig. 3). Underneath the epithelial lining one finds collections of large cells carrying a brownish pigment. This pigment is free from iron as certain special stains show. This, of course, does not speak against the hematogenous origin of the pigment since hemoglobin, after certain chemical changes, loses its iron component.

In order to explain the special features of the case one has to remember certain fundamental embryological data which I shall mention briefly. Tubes, uterus and most probably the upper portion of the vagina originate from the Muellerian ducts, which in the second month of development approach each other to form the sexual cord. This cord presents a double canal, the septum between the two lumina disappearing during the sixteenth week of development. Since the corpus uteri develops from the horizontal (tubal) portion of the Muellerian duct, it is understood that any failure of the epithelial and mesenchymal parts of the duct to shape themselves into the permanent normal form will produce an accentuation of what one calls horns of the adult uterus. These two horns unite, in such cases, at a more or less acute angle, with or without persistence of the septum (Uterus Bicornis Septus, Subseptus, Introrsum Arcuatus). At this stage, however, the two Muellerian ducts have united to such a degree that the term "Double Uterus" or "Uterus Didelphys," so frequently applied to this anomaly, is inapplicable. As long as the myometrium and serosa are insufficiently developed around the epithelial canal to allow a distinction between permanent tubes and the uterus, one must assume the point of attachment of the ligamentum inguinale (Hunteri) as a border line between the two organs. Any structure mesial to this point belongs to the uterine portion of Mueller's duct. The series of persistent embryological malformations, starting with the uterus planifundis as the most insignificant change, would be as follows: (Taken from v. Winckels Classification.)

Uterus arcuatus (septus, subseptus, simplex).

Uterus bicornis (septus, subseptus, simplex).

Uterus unicornis cum. rudimento cornus alterius (according to Menge uterus bicornis with rudimentary development of the other horn).

Uterus rudimentarius partim excavatus.

Uterus rudimentarius solidus.

Uterus didelphys.

According to v. Winckel's researches the malformation in our case must have occurred before the third month of development. Malformations of symmetry, as usually found in the (adult) female are easily explicable from the foregoing considerations. Asymmetrical development (or possibly regression?) are difficult to explain or classify.

From the morphological description of the uterus in question it is fairly certain that the mucous lining as well as the muscularis correspond to those found in postnatal uteri. There was, however, a portion between the main uterine body and the tumor mass attached to it that showed no lumen. The uterine canal was atresic in this intermediate part between uterine cavity and the cavity of the attached mass (therefore "hemiatreticus").

The presence of grumous blood in the cavity and the pigment in the mucosa can be explained only on the assumption of occasional hemorrhages probably of menstrual origin. Hemiatretic cornua sometimes menstruate but often fail to respond to the stimulus causing menstruation in the main body of the uterus. The rudimentary development of one cornu is of frequent occurrence but in that case the main body of the uterus shows marked asymmetry. Such asymmetry, however, is denied by the surgeon who obtained the specimen by operation. Our case is, therefore, difficult to explain and it is necessary to support our assumption that the tumor is a rudimentary horn, by exclusion. The tube of this side arose from the lateral apex of the tumor opposite the attachment of the latter to the uterus (Fig. 4). The round ligament was found to be underneath the tumor. The histological data leave no doubt as regards the uterine character of the tumor. It is to be regretted from the standpoint of elucidation of the case, that the main part of the uterus was not obtained by operation, otherwise one would have had a chance to examine the uterine canal and the myometrium for possible signs of an abnormal or asymmetrical form. It is, from a search among precedents of such cases, improbable that such typical myometrium should have developed around the isthmic part of the tube. Mucosa, glands and the position of the round ligament speak also against this assumption.

With our present knowledge of the pathology of development, it is impossible to throw any light on the causes of maldevelopment of the derivatives of the Muellerian duct. Most cases of uterus bicornis and didelphys (the latter occurring only in pathological feti, not in

adults) show an abnormally broad pelvis which would account for the failure of the Muellerian ducts to fuse into its normal adult shape. The enormous frequency of malformations of these pelvic organs is probably due to the radical changes of position and configuration they undergo during the various periods of development. Their relationship to temporary fetal organs (mesonephros) is an additional factor in explaining the frequency of their occurrence.

FIG. 1.

Fig. 2.



Fig. 3.

FIG. 4.
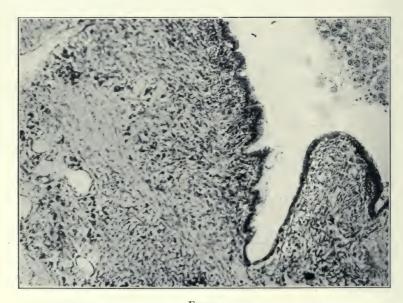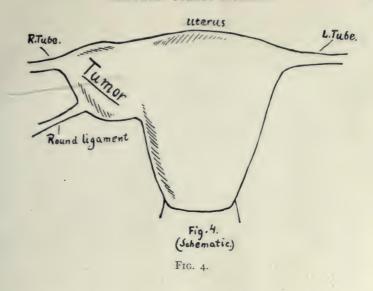


FIG. 5.

# A PRELIMINARY REPORT OF AN OPERATION FOR CYSTOCELE.

BY

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(With eight illustrations.)

THE lack of uniform after-results in operations for cystocele is recognized by all gynecologists. This fact is demonstrated in the literature by the number of operations suggested for the cure of this condition. For some time it has been my endeavor in the repair of cystocele, to restore the anatomical relations of the injured structures. However, the after-results continued uneven and I sought to improve my technic. Therefore, I wish to submit for consideration my present procedure, whose immediate results are so promising as to warrant a presentation at this time.

Cystocele, in the female, is most often defined as a hernia of the bladder resulting from injury sustained during parturition. This injury is caused by the presenting part or results from manual or forceps deliveries. Rarely, cystocele is present in the nullipara and then it is the result of congenital defects in the supports of the pelvic viscera. Usually, cystocele develops gradually and accompanies varying degrees of uterine descensus. However, it may be uncomplicated and is always present with complete prolapse of the uterus. The term hernia as applied to cystocele is misleading as it suggests a definite hernial ring. This is most often absent and commonly we have instead a weakening and sagging of the fascial supports of the bladder and rarely we may find an irregular tear in these tissues.

*Anatomy.*—In the female the floor of the pelvic cavity is formed by the levatores ani and the coccygei muscles with their superior and inferior fascia and the upper and lower fascial layers of the triangular ligament. Some writers attribute to the fascia, others to the muscle, and still others to both the fascia and muscle, the principal support of the pelvic viscera. I believe that Frank(1) is correct when he refers to the "subperitoneal connective tissue" as the holding apparatus and to the "musculo-fascial plate" or pelvic diaphragm as the supporting apparatus. In cystocele we

are primarily interested in the anatomy of the holding apparatus and we shall review it somewhat in detail. To Piersol(2) we are indebted for probably the most concise description, which is as follows.

"*The Pelvic Fascia.*—The pelvic fascia is attached above to the promontory of the sacrum and the iliopectineal line (linea terminalis) of the pelvis where it becomes continuous with the iliac fascia. It descends over the surface of the pyriformis and laterally over the upper portion of the obturator internus and the pelvic diaphragm. In the upper part of its course over the pelvic diaphragm it is crossed by a curved thickening, the *arcus-tendineus*, which is attached behind to the spine of the ischium and passes in front, in the female, upon the bladder, and is continued thence to the anterior pelvic wall to be attached on either side of the symphysis pubis, a little above its lower border, as a *lateral pubovesical ligament*. Along this tendinous arch the pelvic fascia gives off a layer which passes inward to the pelvic viscera, and is termed the *fascia endopelvina*. In its anterior portion this forms an investment of the base of the bladder in the female, and its undersurface in this region is in contact with, and indeed may be regarded as being fused with, the superior layer of the triangular ligament. That portion of the layer which intervenes between the bladder and the posterior surface of the body of the pubis forms what is termed the *median pubovesical ligament*. The continuation of the pelvic fascia passes downward over the sturface of the pelvic diaphragm, and is termed the *superior fascia* of that structure (*fascia diaphragmatis pelvis superior*).

"*The Obturator Fascia.*—From the line along which the pelvic fascia leaves the surface of the obturator internus muscle to pass upon the pelvic diaphragm, a sheet of fascia is continued downward over the surface of the obturator internus muscle to be attached below to the tuberosity and ramus of the ischium and the ramus inferior of the pubis. This is the *obturator fascia*. Along its upper border, nearly corresponding with the 'arcus tendineus' of the pelvic fascia, but lying above this thickening and ending anteriorly farther from the median line, is a similar curved thickening from the spine of the ischium, or in some cases from the iliopectineal line behind, to the posterior surface of the body of the os pubis in front. From this thickening the greater portion of the levator ani muscle arises; it is consequently termed the *arcus tendineus levatoris ani*, or more briefly the *white line*. From the line a thin layer of the fascia is continued inward upon the under surface of the levator ani, forming what is termed the *anal fascia* (*fascia diaphragmatis pelvis inferior*)."

Cunningham(3) gives a slightly different but more detailed description of the pelvic fascia. He refers to it as the endopelvic fascia and says it is a strong membranous layer which consists of two main parts; a parietal part, which forms part of the pelvic wall, and a diaphragmatic part, which covers the upper and lower surfaces of the pelvic diaphragm. The upper fascia of the diaphragm is

known as the visceral layer because it enters into intimate relationship with the pelvic viscera. Strictly speaking, he says, the bladder and urethra, the vagina and the lower part of the rectum lie in the visceral layer of the pelvic fascia.

This visceral layer springs from the parietal layer immediately above the origin of the levator ani. It stretches across the cavity and helps to separate the perineum from the remainder of the pelvis. If it is traced medially, in the posterior part of the pelvis, it is found that the rectum sinks into its substance. In front of the rectum it is carried over the upper part of the vagina on to the uterus, and in front of the uterus, it is lost on the bladder. Still more anteriorly it can be followed across the median plane to the opposite side. In this last part of its extent two thickened bands of its substance, one on either side on the median plane extend from the back of the pubis to the anterior border of the bladder.

If it is traced from its origin at the parietal fascia toward the median plane it is found to divide into secondary lamellæ which ensheath the pelvic viscera. These lamellæ are the vesical, the rectal, and the rectovaginal. The vesical layer passes on to the bladder and in front of the urethra and vagina; the rectal layer passes behind the rectum; and the rectovaginal layer crosses between the rectum and vagina. Further in describing the true ligaments of the bladder, Cunningham says: "the lateral pubovesical ligaments are merely the lateral parts of the vesical lamella; while the anterior or medial pubovesical ligaments are thickenings of the anterior part of the same lamella, on either side of the median plane. The lateral ligaments connect the inferolateral surfaces of the bladder to the main layer of the visceral pelvic fascia, and indirectly to the side wall of the pelvis. The anterior bind the anterior border of the bladder to the back of the symphysis pubis" (see Figs. 1 and 2).

Kelly(5) in describing the natural landmarks in the bladder says: "important points of reference also are those relating to the fixed and movable portions of the bladder. As the bladder is emptied, the upper, more movable portion, covered with peritoneum settles down into the lower, and relatively more fixed portion, which lies in close relation to the vagina, until it comes to lie within it as one saucer rests in another." In my opinion the fixed portion of bladder, referred to above, corresponds to the support given to the bladder by the vesical fascia or true ligaments.

Whether we accept the anatomy of the "holding apparatus" as described by Piersol or by Cunningham, we are impressed by the

fact that the bladder is held up by thickened connective tissue which has a sling-like action. Thus the bladder differs from other viscera supported by ligaments. This has been graphically described by one author who says that all other viscera, when full or dilated, descend, whereas the bladder when full or dilated ascends. This fact is also in keeping with Kelly's description of the natural landmarks in the bladder. In other words when the bladder is functionating normally, that is, acting as a reservoir, and any strain is put on it, its plane of motion is away from its true ligaments.

In repair of cystocele, our work is based on a false premise if we attempt to restore the normal relations and landmarks of the bladder by attaching it by false ligaments to the uterus and broad ligaments. This is doubly true, if at the same time we disregard or even destroy, by our dissection, the true ligaments of the bladder. So too will we fail to obtain satisfactory after-results in our attempted anatomical repair if we simply dissect out the edge of the true pillars and coapt them with simple sutures or with mattress sutures which only form a slight buttress in the midline. We must remember that while the true ligaments are spoken of as fascia, they are not fascia such as fascia lata or even the fascia of the external oblique. Furthermore, in cystocele this fascia is thinned out and weakened and suturing as above will at best coapt only weakened tissues which will not be restored to their normal holding strength and in a large percentage of cases there will be a recurrence of the cystocele. These methods are, therefore, but little better than anterior colporrhaphy. When this was the operation of choice the need was recognized for a strong buttress under the bladder and this gave rise to transposing the broad ligaments, the levator ani or even the uterus, for the cure of cystocele. The following technic, which I offer, is an extraperitoneal operation with a free mobilization of the bladder and its pillars. This enables us to lap the true ligaments and restore their sling-like action to the normal or greater holding power, and thus restore the landmarks in the bladder.

*Technic.*—A small volsellum forceps is applied to the mucous membrane of the anterior vaginal wall about 1 centimeter above the cervix and another forceps about 1 centimeter below the external urethral orifice. Between these forceps a vertical incision is made through the mucosa and superficially into the underlying tissues. As soon as an edge on either side can be grasped with Allis forceps they are used as tractors and the incision is carefully carried forward until, in the midportion, the bladder can be demonstrated by blunt dissection (Fig. 3).

This blunt dissection is continued downward until the cervical attachment of the bladder pillars and the so-called uterovesical ligament are demonstrated.    The latter is cut with scissors, keeping well in midline to avoid severing any of the cervical attachments of the bladder pillars (Fig. 4).

The bladder is now separated by blunt dissection, using the gauze-covered finger, from the cervix upward to the peritoneal reflection and laterally well out to either side.    By further blunt dissection the bladder is separated from the underlying pillars upward to the urethra and well out on either side.    If there is a urethrocele, the dissection is carried up to the external urethral orifice.    When the bladder is well mobilized, the bladder pillars are dissected from the underlying vaginal mucosa (Fig. 5).

In the midline the fascia and underlying mucosa are most often densely adherent and it is only with the greatest care that the true line of cleavage can be demonstrated.    Too often at this point, by haste or the cutting of unidentified structures, the fascial sling is destroyed or buttonholed and we will fail to demonstrate a firm connective tissue.    With the technic which I shall now describe I have always been able to demonstrate the bladder pillars even in elderly multipara with a long-standing prolapse.

With a finger under the mucosa as a guide on which to cut down, the thinned-out fascial edge is dissected with a knife from the under-lying mucosa.    The mucosa flap is made paper thin and as soon as possible Allis forceps are applied as tractors to the fascial and mucosal edges.    This cutting dissection is continued from the midline, downward and upward, for a short distance laterally until by blunt dissection a distinct line of cleavage is demonstrated the whole length of the primary incision.    The mucosa is now easily separated, by blunt dissection, from the overlying pillars well out on either side to the "arcus tendineus."    Thus is demonstrated the strongest and thickest portion of the fascia and gives us two fixed points from which to estimate the amount of overlapping necessary to take up the slack in the fascial sling.    The dissection is quite extensive but is comparatively free from bleeding unless by accident we injure the vaginal plexus of veins or the vaginal branch of the vesical artery which runs on the pubovesical ligament.

The bladder and its lateral true ligaments are now freely mobilized and the latter are overlapped from side to side by transverse mattress sutures of medium kangaroo-tendon, at the level of the internal os one or two sutures enter the cervical tissue.    A reference to Figs. 6 and 7 will demonstrate better than words the technic and

function of these sutures. These sutures prevent anteroposterior shortening of the anterior wall of the vagina and draw the underlying fascia smoothly under the overlapping fascia. In addition the cervical suture reattaches the fascia to its original place on the cervix and forms a shelf on which the bladder rests (Figs. 6 and 7).

After the mattress sutures are tied, the free edge of the overlapping fascia is sutured, by interrupted sutures of fine kangaroo-tendon, to the underlapped fascia. The paper-thin vaginal mucosa flap, caused by our dissection, is now excised for a short distance on either side. Its edges are approximated in midline by interrupted suture of ten-day chromic catgut. To prevent a dead space between the fascia and mucosa a vaginal pack of iodoform gauze is used and is removed the fourth day after operation (Fig. 8).

### SUMMARY.

1. This technic offers a strong and anatomical restoration of the supports of the bladder without causing anteroposterior shortening of the anterior wall of the vagina.

2. The technic gives promise of restoring the anatomical relations in the bladder and of preventing the many abnormal conditions as reported in a study of the after-results of cystocele operations by Broun and Rawls(6).

3. The method is applicable to all forms of cystocele but when there is a complete prolapse of the uterus, other methods must be used in addition, to relieve the injury to the posterior segment of of the "holding apparatus" and the injury to the "supporting apparatus."
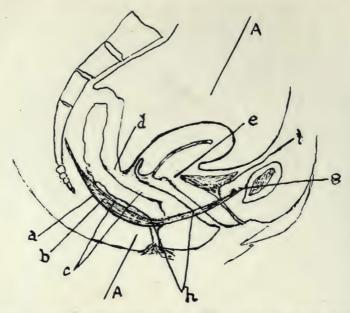
FIG. 1.—Showing the division of the endopelvic fascia into the various layers in connection with the viscera. *a*, Anal fascia; *b*, levator ani; *c*, rectal layer; *d*, rectovaginal layer; *e, f, g*, vesical layer (*e*, vesicovaginal layer; *f*,vesical layer and *g*, anterior ligament of bladder); *h*, lower layer of endopelvic fascia; *AA*, plane of section in Fig. 2.    (*From Fitzgibbon: Surg. Gyn. and Obst.*, 1916, vol. xxii, p. 9.)
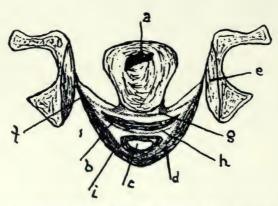


FIG. 2.—Coronal section through pelvis showing the division of the visceral layer of pelvic fascia into layers in relation to the viscera. *a*, Uterus; *b*, vagina; *c*, rectum; *d*, levator ani; *e*, obturator internus; *f*, visceral plevic fascia; *g*, vesical or vesicovaginal layer; *h*, rectovaginal layer; *i*, rectal layer. (*From Fitzgibbon: Surg. Gyn. and Obst.*, 1916, vol. xxii, p. 10.)
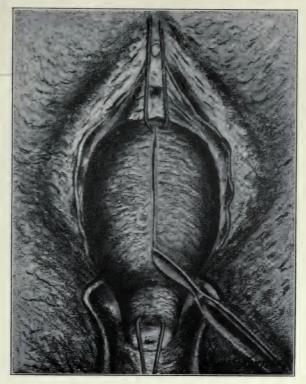
FIG. 3.—Incision in anterior wall.
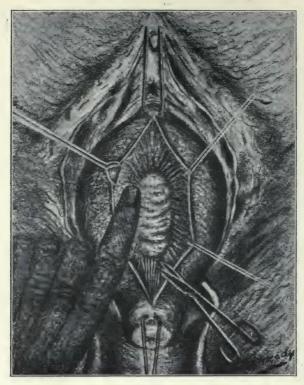
Fig. 4.—Incision down to second line of cleavage, bladder demonstrated in mid-line by blunt dissection, so-called uterovesical ligament about to be cut with scissors, the edge of the pillars of the bladder are partly demonstrated but for the greater part they are still attached to underlying vaginal tissues.
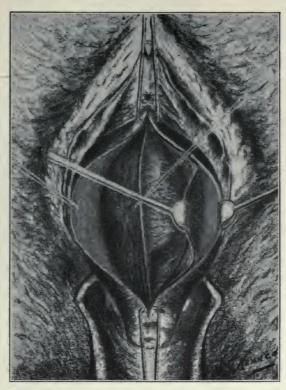
FIG. 5.—Bladder freely separated from the cervix up to peritoneal fold and well out on either side; also freely separated from the underlying pillars.   On the left the pillar of the bladder has been separated from the underlying vaginal tissue and by blunt dissection well out to the "arcus tendineus."   On the right the cutting dissection of the pillar from the underlying vaginal tissue has been  completed for the mid portion, and the blunt dissection has been started.

*Note*.—The cutting dissection along the  whole line of the incision should be done before any further blunt dissection is attempted.
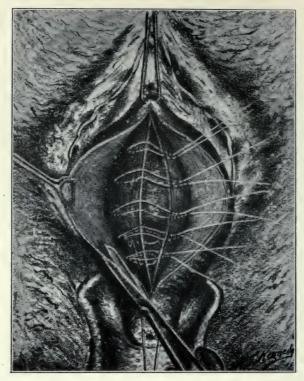
FIG. 6.—Free mobilization of the bladder and its pillars. The transverse mattress sutures in place; the lower two include the cervix in their bite.
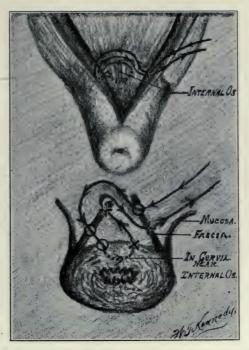
FIG. 7.—This demonstrates the transverse mattress suture which enters the cervix at the level of the internal os.   The arrows show the direction of the suture and *O* and *X* the points that will be approximated by the suture.   Thus the fascial edge on the left is drawn smoothly under the overlapping fascia and the lapped tissues are firmly attached to the cervix.
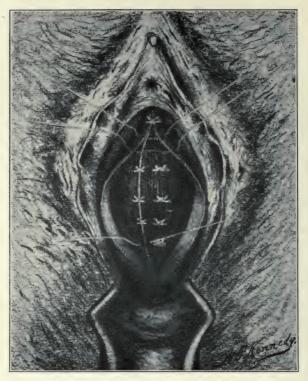
Fig. 8.—Lapping transverse mattress sutures tied; on the left the sutures holding overlapping free edge are all tied except the lower one. Above the sutures approximating the vaginal mucosa have been partly placed and tied.

# PROCIDENTIA IN THE NULLIPAROUS WOMAN.

BY

## WILLIAM M. FORD, M. D.,

New York City.

(With three illustrations.)

PROCIDENTIA in a nulliparous woman, while not common, would seem to be encountered sufficiently often to warrant the development of an appropriate operative technic for its cure. Keppler, of Boston, in 1911, reported 150 cases collected from all sources. While the writer has seen several cases of this nature he bases his present observations largely upon two cases which presented themselves for treatment in September, 1916.

Misgivings as to whether the topic was one which would interest this Society were in a measure quieted when an inspection of the meager literature on the subject revealed that at least eleven, and probably more, of our members had had some opinion on the subject already committed to print.

The important etiological factors seem to have been: increased abdominal pressure induced by hard work or tight lacing, stretching of the fascia underneath the base of the bladder, a procidentia, the evolutionary result of a cystocele which appeared early, and which was followed, in time, over the perineum by the cervix, the cervix in turn being followed by a rolling out of the posterior vaginal wall. The rectoceles were not noticeably large. If the uterus was replaced the appearance of the vulva was substantially normal. When the prolapse was artificially induced the cystocele and cervix were delivered over the perineum in much the same manner as the fetal head is normally expelled.

The indications therefore, were: first, to procure especially firm support anteriorly at the vulvar cleft; second, to maintain a canal discharge of uterine secretions; third, to maintain a potential capacity for reproduction. My endeavors to meet these indications resulted in an operation a brief description of which follows.

*First Stage.*—The cervix is grasped with a double tenaculum and drawn well down. A transverse incision is made at the cervico-vaginal junction halfway around the front of the cervix, the anterior

margin of the wound is grasped with "T" clamps and the point of a pair of dissecting scissors is thrust beneath the mucous membrane of the anterior vaginal wall forward to a point opposite the internal urethral orifice. The scissors are then spread and withdrawn, and the loosened mucous membrane divided from the cervix to a point opposite the internal urethral orifice (Fig. 1). These vaginal flaps are then dissected from the surrounding tissue by stripping with a gauze-covered finger. The ball-like bladder then protrudes through the wound (Fig. 1, A). The vesico-uterine ligament is next cut and the bladder stripped from the anterior face of the uterus until the peritoneal fold between the uterus and bladder is readily visible, when the bladder can be easily pushed out of sight behind the pubes. The entire wound is then packed lightly with gauze, to control the oozing, and the cervix placed within the vagina.

*Second Stage.*—The second stage of the operation is now begun. Hooks are placed on either side of the fourchette and separated in such a manner as to render taut the posterior margin of the vaginal entrance (Fig. 1, GG). This taut strip of muco-cutaneous tissue is picked up with a pair of tissue forceps and cut away. Two "T" clamps are then applied to the margin of mucous membrane, both are grasped in the left hand and held upward while the right hand covered with gauze, strips a triangular flap of the posterior vaginal wall from the underlying tissues to render easily accessible the levator ani muscles (Fig. 3, B). This is sometimes facilitated by plunging a pair of dissecting scissors into either angle of the wound just beneath the vaginal mucous membrane spreading their points and withdrawing them. The muscles are then grasped on either side by double volsella and drawn well forward and toward the midline, a second, and sometimes a third application of the volsella on each side is required to exhibit them well. When the levator on each side has been well mobilized the next step of the operation is undertaken.

*Third Stage.*—The gauze packing in the anterior wound is removed. The left index-finger is inserted into the opening in the anterior vaginal wall and carried outward and backward and to the patient's right (Fig. 1, F) around the vagina until it comes in contact with a pair of dissecting scissors which are simultaneously passed through the posterior vaginal wound and carried outward to the patient's right (Fig. 1, E) and forward about the vagina. When the two come in contact the blades of the scissors are separated, thus establishing a communication between the anterior and posterior incisions. The same procedure is repeated on the

opposite side so that for a short distance the entire vaginal circumference is freed from underlying tissue.

Into the wound in the anterior vaginal wall is then passed a double French hook which is carried to the patient's right outward and backward, around the vagina and through the opening of communication into the posterior wound where it grasps the margin of the levator ani muscle on that side. The instrument is then withdrawn, and with it, into the anterior wound is drawn the anterior portion of the levator of that side (Fig. 2, B). The same procedure is repeated on the opposite side. A medium-sized kangaroo tendon threaded on a sharply curved round pointed needle is next passed through the left levator ani muscle from without inward, then through the double fold of peritoneum (which was exposed when the bladder was dissected free) into the uterus and back through the peritoneal folds and then inserted into the margin of the right levator muscle from within outward (Fig. 2, E). Two or three such sutures are sufficient; the ends which protrude through the opening in the anterior wall of the vagina are clamped and laid aside and the French hooks removed. The bladder (Fig. 2, A) is held by a sponge stick in its forward position behind the symphysis while a buried purse-string suture of chromic gut No. 2 closes in the loose tissue about its base. The cervix is then withdrawn from the vagina. Any excess of vaginal mucous membrane is now cut away, and the cut edges of mucous membrane are approximated from side to side with interrupted No. 2 chromic catgut sutures from behind forward to a point opposite to where the kangaroo tendon sutures emerge. When this point is reached the kangaroo sutures are tied. To do this in such a manner as to approximate the levator ani muscles below the bladder and uterus and above the anterior vaginal wall it is necessary to replace the cervix within the vagina. The remainder of the anterior wound is then closed with interrupted No. 2 chromic catgut sutures (Fig. 3).

*Fourth Stage.*—Through the posterior wound the levator ani muscles are again grasped and held with volsella until sutured with medium kangaroo tendon mounted on a full-curved round pointed needle; about four interrupted sutures passed from side to side are sufficient (Fig 3 B). The top stitch when tied should be sufficiently high to constrict the vaginal orifice which is then completely sur rounded by the levator muscles. The volsella are then removed but the kangaroo sutures are not tied until later.

The triangular flap of mucous membrane which was stripped from the posterior vaginal wall (Fig. 3, C) is then cut away, and the mucous membrane at the apex of the denuded triangle is drawn down until it

reaches the hooks which were placed upon the lateral extremities of the fourchette, and the edges of mucous membrane thus approximated are sutured with running stitches of No. 2 chromic catgut; one suture in each angle and the hooks removed. The remaining kangaroo tendon sutures are next tied. The vaginal canal is now so constricted at the outlet that it will just admit the tip of the index-finger, and the uterus should rest horizontally above the united levators. Two or three silkworm-gut sutures are next passed in through the skin, perineal connective tissue, and surface of the levator ani muscle on one side and out through tissues on the opposite side in the reverse direction. Before these are tied a continuous suture of catgut closes the skin from the fourchette backward toward the anus. The silkworm-gut sutures are then knotted very loosely in order to provide against "cutting in" when the tissues swell and the operation is complete.

In the hands of one familiar with plastic work the operation should not consume over thirty-five minutes: it provides pelvic support from about opposite the internal urethral orifice backward to the anus, which is uninterrupted, save for the opening opposite the vagina which will not admit the index-finger; it conserves the continuity of the vagina, thus providing for the exit of uterine secretions. The potential capacity for reproduction is not destroyed although the possible necessity for episiotomy is conceded. It is a procedure which I have found useful in certain parous women presenting a similar pathology.

FIG. 1.—*A*, Bladder.   *B*, Mucous membrane of anterior vaginal wall.   *C*, Cervix.   *D*, Wound made in second stage of operation.   *E*, Scissors introduced in third stage of operation.   *G*, Points at which hooks are applied when beginning second stage of operation.
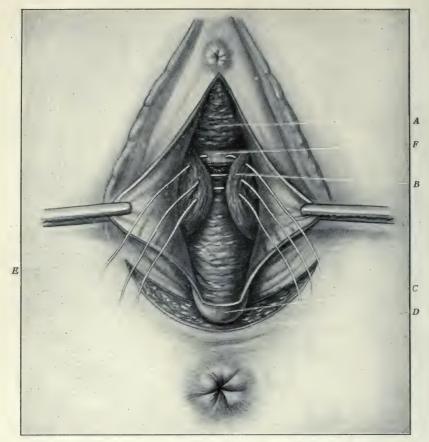
FIG. 2.—*A*, Bladder.   *B*, Levator ani.   *C*, Cervix.   *D*, Wound made in second stage of operation to expose levators.   *E*, Suture passing through anteriorly displaced levator ani, peritoneal fold between bladder and uterus, uterus and levator on opposite side.   *F*, Peritoneal fold between bladder and uterus.
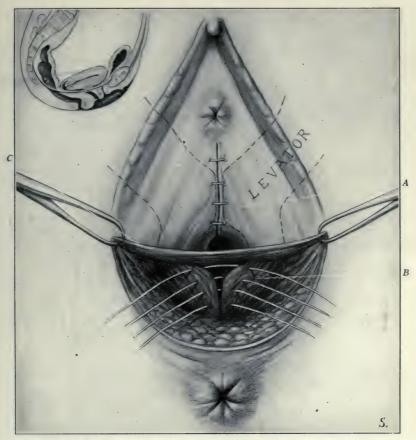
FIG. 3.—A, Levator ani united in front of vagina and covered with mucous membrane.   B, Levator ani sutured behind vagina.   C, Mucous membrane of posterior vaginal wall.

# AN AUTOMOBILE LABORATORY.

BY

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(With two illustrations.)

THE need of a mobile laboratory usually occurs in relation to some special hygienic problem, as the study of a water supply or of an epidemic.

It is rare that there is a call for a mobile laboratory for general pathological work, and such as have been outfitted have been of a rather large and expensive type, housed in Pullman cars. In 1916 the British army used an automobile laboratory especially designed for the study of cerebrospinal meningitis among the troops. Also Wallace and Tiernan, sanitary engineers, have equipped a number of laboratories for water analysis, chlorinization and filtration, and others especially for bacteriological work connected with water analysis. These were rather large and high priced, but admirably adapted for the work.

The writer recently had the privilege of planning and fitting out a motor laboratory for the use of the Serbian Army, given by Mrs. Frederick F. Thompson under the management of the American Woman's Hospital Association.

This car was exhibited at Hero Land and excited some interest so that a description may be of help to others in the future.

The especial aims sought for were completeness, compactness, utility and simplicity. The American Woman's Hospital Association had already chosen a Ford truck for the chassis, a choice which could not be bettered. They had followed the general design of the British car in a special body which, though constituting the greatest item of expense, is admirable for the purpose. The frame of the car is strengthened by extra braces; the rear wheels have solid tires; there is a 15-gallon water tank on the roof, fed by a rotary hand pump. There is an ample hood extending over the driver's seat. This seat accommodates four persons comfortably and beneath it are the kerosene and gasolene tanks. Above seat is a let-down wire mattress, 6 feet × 18 inches.

The engine has been adapted to burn kerosene, by using the ex-

haust gases to heat the fuel, by circulating around the manifold. Although kerosene as an automobile fuel is still in the experimental stage this modification does not interfere with, but on the contrary, improves gasolene as a fuel if it is desired to use that.    The only disadvantage is that of carbonization in the cylinders, but once that is appreciated and the carbon cleaned out every 500 miles by running kerosene into the cylinders, it cannot be called a serious fault.

The advantages of kerosene are universal distribution and price.

The rear of the car has a let-down tail-board, affording an extra seat when closed.

The interior dimensions of the car are 7 feet 8 inches × 6 × 6 feet 6 inches height.    There is a coach roof with side ventilating windows.

There are two wire-glass windows 3 × 2 feet 6 inches and 36 inches from the floor, the windows tilting outward, held by strong springs. The front and left side of the room are occupied by a table at the height of the window, and 24 inches wide across the front and 20 inches wide on the left side.    The left-hand front corner of the table has a white enamel sink 18 × 18 inches flush with the table top, small plain faucet and supply pipe through from tank on roof. The right front corner is occupied by a fire-proofed, zinc-lined chamber, 24 × 24 inches, with double doors, outer half wood, inner half wire glass, vent to roof.    Beneath this chamber is a cupboard, left front corner holding fire-proofed box for incubator lamp.    Chimney of this goes through a hole in floor of the fire-proof chamber and affords the heat for the incubator.    This incubator forms the left wall of the fire-proof chamber in its lower half, and the upper half has a slot for thermo-regulating lever.

*Incubator.*—Any chicken incubator can be used, with a kerosene lamp.    The remaining portions of front table are covered with zinc.

The work table at the left side has a $\frac{1}{4}$-inch rim above the front edge.    The top is finished black, with aniline hydrochloride, acid-and-alkali-proof table-top finish.    Below the table to the left of the window is a stack of drawers, the top shallow, the lower ones grading deeper.    On either side of the window are guarded shelves to the ceiling, the upper tiers partitioned into squares to hold 500-c.c. stock laboratory bottle ($\frac{1}{2}$ gross).    Draining pegs and graduate racks over front sink wall.    Below window table is a hinged stool which springs under table when not in use.

Under window on right is a let-down hinged table, while a locker with upholstered seat in the right back corner of the room enables this table to be used as a desk.    Paper rack on wall and luggage rack above window.

Equipment, chosen largely from Catalogue 3, Council of National Defence, comprises, autoclave (small, can be had for $15; larger, use a steam-pressure cooker, household type). Arnold sterilizer, square, B. of H. type, best, but expensive. Round type more practical. Dry heat sterilizer, still, centrifuge, microtome, microscope, glassware, etc.

A self starter, with electric lights, was considered, but judged impractical on account of weight chiefly, but expense, drag on engine and the impracticability of using the current for the incubator, were other objections. The car is lighted by two swivel pilot lamps, one by work table and one on front wall, also two smaller binnacle lamps on rear walls. A pressure filter would be useful, but not strictly a diagnostic laboratory fitting.

The whole cost of this car was within $3000, of which more than half was for the special body.

In another car it would be desirable to substitute an engine-driver centrifugal pump for the hand pump installed on the step.

FIG. 1.—Ambulance for the Serbian Army given by Mrs. F. F. Thompson for the American Women's Hospital Association.

FIG. 2.—Showing arrangement of interior of ambulance.

# REPORT OF A CASE ILLUSTRATING THE VALUE OF KIDNEY DRAINAGE WITH THE URETERAL CATHETER, OF PELVIC LAVAGE AND INTRAURETERAL MANIPULATION.

BY

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(With four illustrations.)

THE patient, a woman, thirty-four years of age, married, was first seen March 10, 1915. There was a history of chronic constipation, which has been pronounced for the past five years. She had three children previous to 1911, when, during pregnancy, she experienced pain in the right side of the abdomen and back. This was intermittent until December, 1914, when an oxalate calculus, 1.5 by 1 cm., was removed from the right ureter, at the level of the pelvic brim. Following this operation an ureteral fistula persisted. At the time of the first observation, three months after the ureterotomy, all the urine from the right kidney was draining through the wound. Cystoscopic examination at this time showed the mucous membrane of the bladder and urethra thickened, dull, hyperemic, the bloodvessels poorly marked, and flakes of pus loosely adherent to the surface. The right ureteral orifice was slightly dilated, and the surrounding area was somewhat edematous. No urine was emitted from the right ureteral orifice, but there was a rapid flow from the left. A slight cystocele was present, due to the lack of proper support resulting from perineal lacerations, and the patient did not completely empty the bladder. A catheter passed to the left kidney without difficulty. There was a rapid flow of hazy urine, which was acid, had specific gravity of 1012, and showed albumin, blood, pus, and colon bacilli. A catheter on the right side encountered an obstruction at 18 cm. After considerable manipulation a No. 5 catheter passed to the kidney. There was a rapid flow of cloudy urine which was alkaline, with specific gravity of 1015, and showed albumin, a sediment of blood and pus, and colon bacilli. The right catheter was left in position for six days, at the end of which time the urine from the right kidney became clearer and drainage from the fistula ceased. Following the removal of the

catheter the patient had a typical attack of renal colic and passed a calculus. During this attack and since then the fistula has not reopened.

When first seen the patient was in a highly nervous state, her appetite was poor, her bowels were constipated, and she had an evening temperature; the heart action was rapid and weak; the abdominal wall was flabby; the right kidney was enlarged, tender, easily palpable, and freely movable; the left kidney was palpable and slightly tender.

After kidney drainage by ureteral catheter had been maintained for three days, with daily lavage of the renal pelvis, the picture changed. The temperature became normal, heart action improved, tenderness in both kidneys decreased, appetite returned and the patient, who had been distinctly septic, began to eliminate.

During the passage of the calculus, six days after the removal of the right ureteral catheter, the patient developed anuria. After the passage of the calculus there was a profuse excretion and the patient's condition rapidly improved under colonic irrigations and urinary antiseptics.

One month after the passage of the calculus the patient had another attack of renal colic. An obstruction, encountered by the ureteral catheter at the same level as before, was passed after manipulation. There was a rapid flow of cloudy urine from the kidney. In twenty-four hours the kidney, which during the colic was large and tender, became reduced in size and the urine cleared. When the catheter was removed after forty-eight hours, a calculus was passed.

At this time a soft ureteral x-ray catheter was passed and a radiograph taken. This picture (Fig. 1) showed a diverticulum of the ureter, the catheter making a complete loop in the dilated portion, then passing into the kidney. The diverticulum was at the point from which the first ureteral calculus was removed.

Similar attacks followed at irregular intervals. In each instance the colic was relieved in the same manner and was followed by the passage of a calculus. During 1916 *ten* calculi were passed following intraureteral manipulation. Three were removed from the lower ureter by means of ureteral forceps.

In February, 1917, ureteral catheters were retained for seven days. At the expiration of this time the separate urine showed:

| Right kidney | Left kidney |
|---|---|
| Acid. | Acid. |
| Trace albumin. | Faint trace albumin. |
| Urea, 0.4 per cent. | Urea, 1.4 per cent. |
| Hyalin, granular, blood-studded casts. | No casts. |
| Occasional red blood cells. | Rarely a red blood cell. |
| Innumerable pus cells. | Occasional pus cells. |
| Numerous ureteral epithelia. | Numerous ureteral epithelia. |
| No crystals. | No crystals. |
| Colon bacilli. | Colon bacilli. |

At this time, as well as at each previous attack, the advisability of nephrectomy was considered, but the presence of infection in the left kidney, with poor urinary output, contraindicated this procedure.

A pyelogram at this time (Fig. 2) showed a clubbing of the minor calyces, dilatation of calyces and pelvis of the right kidney, and diminution in the size of the ureteral diverticulum. A plain radiograph with catheter in position showed a large calculus in the right ureter. On withdrawing the catheter it frequently caught, requiring quite a strong pull to free it.

On July 4 and 5, 1917, the patient had severe colic. Cystoscopic examination July 7th (Fig. 3) showed an obstruction 8 cm. from the bladder in the right ureter. By twisting the catheter in the fingers it coiled about the calculus. Traction, which was then applied, brought on colic. The catheter was loosened by uncoiling. The patient went home and within an hour, during a severe pain, which she likened to a labor pain, passed the calculus, 3.5 by 1.5 cm., shown in the cut (Fig. 4). The passage was followed by a gush of urine (over a quart by her statement). This was followed by complete relief of pain and discomfort, and the patient has been well to date.

Cystoscopic examination November 20, 1917, showed bladder and ureters free of inflammation, no obstruction of either ureter, a normal urinary flow on each side. Catheterized specimens were as follows:

| Right kidney | Left kidney |
|---|---|
| Acid. | Acid. |
| Trace albumin. | Trace albumin. |
| Urea, 1.2 per cent. | Urea, 2.2 per cent. |
| Occasional hyalin and finely granular casts. | Occasional hyalin and finely granular casts. |
| Rarely a red blood cell. | Rarely a red blood cell. |
| Rarely a pus cell. | Rarely a pus cell. |
| No crystals. | No crystals. |
| Colon bacilli. | Culture negative. |

The lower pole of the right kidney was palpable, left kidney not palpable. No tenderness. General condition excellent. Bowels regular with mild medication. No urinary symptoms.

The last examination, February 5, 1918, showed kidney urines free of pus and colon bacilli. Patient has taken no medication other than hexamethylenamin, urotropin and sodium benzoate āā gr. v, twice a day. She has gained 20 pounds, feels very well, bowels are regular, appetite good. She has worn a well-fitted corset for the past year which has given her excellent abdominal support.

The interesting facts in this case are:

1. History of obstinate constipation.

2. Abnormal mobility of right kidney.

3. First calculus found during pregnancy, when constipation was increased, greater amount of toxic material and bacteria were thrown upon the kidney, with poor drainage of the latter.

4. Formation of diverticulum at point where ureter was opened, due to traumatism of ureter and presence of a second calculus below, which was not removed at the operation.

5. Presence of a bilateral kidney infection.

6. Rapid closure of the ureteral fistula and the improvement in the patient's condition under continuous kidney drainage with retained ureteral catheters.

7. Formation of calculi in ureteral diverticulum.

8. The possibility of removal of ureteral calculi by means of intraureteral manipulation, even to the size of the calculus shown in the cut.

9. The complete cure of the infection and with it the cessation of calculus formation, by attention to the general condition of the patient, care of the bowels, abdominal support, and local treatment of the kidneys by lavage.
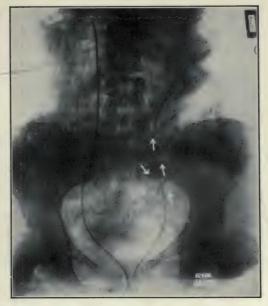
FIG. 1.—Soft ureteral catheter making complete loop in diverticulum of ureter.



FIG. 2.—Thorium injection of right kidney and ureter. Inflammatory dilatation. Diminution in size of diverticulum.
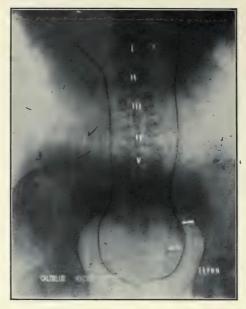
Fig. 3.—Large calculus in right ureter.



Fig. 4.—Calculus shown in Fig. 3. Removed by coiling catheter about the
calculus and applying traction.

## THE NEW OPERATING ROOM LIGHT IN THE WOMAN'S HOSPITAL.

WHEN the new operating room in the Thompson pavilion was under construction, the question of adequate light was entrusted to a special committee of the Surgical Board. The committee thoroughly investigated the various facilities for lighting operating rooms in prominent hospitals both in this country and abroad. As a result of this study, the committee formulated certain ideal conditions that a light in an operating room should have. First, it must give adequate illumination of the field of operation; second, shadows should be prevented, and third, the light should have as little heat as possible.

These specifications were placed before Mr. W. P. F. Hill, chief engineer of the Woman's Hospital, who then planned the ingenious and efficient device for light, now in use, in the new operating room of the Thompson pavilion.

This new operating room light does away with the objectionable features of lights in operating rooms now in vogue. It is the only light of its kind in existence and is by far the best light for the purpose thus devised, as it fulfils all ideal conditions. It gives a perfect illumination of the field of operation, as the light comes from different points of the circumference, shadows are done away with, and being a reflected light, heat is eliminated. The light comes from the ceiling over the operating table. The apparatus was constructed by Bausch and Lomb, of Rochester, N. Y. The only visible part of this well constructed and efficient device are the circular glasses through which the rays of light project. Not only is this light a very efficient one, but very economical; the average expense for current is about 6 cents an hour.

The following is the maker's description of the device.

In the apparatus illustrated herewith, there are eight separate illuminating units, each unit consisting of a 250-watt Mazda lamp and suitable optical system inclosed in a metal casing and used in conjunction with an adjustable reflecting mirror. These units are mounted on a steel plate approximately 9 feet in diameter which is fastened to the ceiling of the operating room or these units could be placed on the floor of a room directly above the operating room.

The optical system of each unit points toward the periphery of the
plate where the beam of light strikes the adjustable mirror which
reflects it downward through a plate glass window and by means of
the adjustable mirror all eight beams of light from the margin of
the plate can be adjusted to overlap on the operating table and to
illuminate a spot approximately 18 inches in diameter.   The optical
system can be modified to suit conditions in any Hospital as regards
the distance of the ceiling above the operating table.   Four of the
illuminating units have a supplementary optical system attached to
the rear of the housing inclosing the Mazda lamp and the purpose
of these four supplementary systems being to direct four central
beams upon the operating table so that there are in all, twelve
separate beams of light overlapping to illuminate a spot approxi-
mately 18 inches in diameter.   It will be seen at once that no matter
what the position of the operating surgeon may be, objectionable
shadows will be eliminated because of the multiple sources of illumi-
nation.   By having the illuminating units mounted on the metal
plate with glass windows as shown in the illustration or by mounting
them in a room above the operating room and equipping the floor
with glass windows, there is absolutely no possibility of dust or
other particles which might collect on the ordinary illuminating
apparatus falling down upon the operating table.   The arrangement
of the optical system is such that while the different beams of light
are concentrating on one spot, the heat has been almost entirely
eliminated because the adjustment is such that no particle of the
lamp filament is imaged upon the operating table.   By actual test
it was found that this system of illumination increases the tempera-
ture upon the operating table only 3 degrees during an interval of
thirty minutes.

Fig. 1.—Optics of operating room illumination.
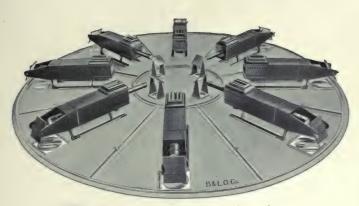


Fig. 2.—View of operating lights from above.

# SOME PROBLEMS IN GYNECOLOGY.

BY

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IN a hospital devoted to the treatment of diseases of women, as in any special hospital, one is apt to fall into routine lines, at least as far as the better known procedures are concerned. From time to time improvements in technic are suggested, tried, and, if found good, are adopted and finally become part of the well recognized routine. Perhaps a review of some of these conditions may prove valuable in suggesting something that may improve our knowledge or skill and thus the usefulness of the hospital itself. It seems hardly necessary to review the work that has been done in the past. Emmet, by his operations for the cure of lacerations of the cervix and of the perineum did a great deal to establish gynecology as a special department of medical science. Modern gynecology now recognizes not only the fact that lacerations of the cervix should be repaired whenever the laceration is extensive enough to produce pathological changes in the cervical tissue, as recommended originally by Emmet, but also the fact that these changes are frequently precancerous in character and demand as routine treatment not the old Emmet operation of repair but the more radical operation of amputation. On my own service amputation of the cervix has been performed about ten times as often as the operation for simple repair. In the last two reports of the Woman's Hospital (1915 and 1916), a study of the operative statistics shows that amputation of the cervix has been done 337 times and repair only 203 times.

The indications for the operation of amputation include not only the so-called ulcerations of the cervix and their relation to the development of cancer, but a variety of other conditions, such as hypertrophy of the cervix associated with enlargement and displacement of the uterus. Amputation in such cases reduces the uterus in size and so aids other operative procedures for the correction of displacements. In a woman past the child-bearing period there is no objection to amputation, but in younger women still

liable to become pregnant, the propriety o routine amputation is still very problematical. I have occasionally seen a confinement case where the obstruction to labor through a previous amputation of the cervix and the resulting scar tissue was sufficient to necessitate Cesarean section. I am always concerned when I undertake the delivery of a patient who gives a history of having had an amputation of the cervix.

For many years operation for the repair of the perineum (or for the restoration of the pelvic floor) was a procedure consisting in simple denudation and suture. This was modified by different operators in unessential details, but none of them gave what now should be regarded as really satisfactory results. Of all the various operations, that of Emmet was the most widely known and most frequently performed. In certain cases the results were ideal, but in' many others the patient's condition was not improved in the slightest degree.

In the *Bulletin* of the Woman's Hospital published in October, 1913 (vol. i, No. 5), I described an operation, the steps of which were illustrated by photographs, which I called the muscle operation. The essential features were the mobilization of the edges of the levator ani muscles and the suturing together of these edges, besides suturing the fascial planes of the pelvis and lastly the vaginal mucous membrane and skin. The operation is based on the same principles that underlie the closure of the abdominal wall in layers. At the present time the restoration of the pelvic floor is almost universally performed according to these principles if not entirely by this technic. It is only a very short time ago that this improvement in probably the most frequent of all gynecological operations was devised. Up to this comparatively recent time all sorts of operations for this condition were daily performed with results, in most cases, that were not good. The Woman's Hospital should receive more credit for this muscle operation than it has. Up to the time that the description was published no similar operation had been described, at least so far as I could ascertain at the time. (It was performed in essentially the same way for two or three years previous to October, 1913.)

Every hospital should be a teaching institution. Its power for good, its efficiency and its every activity would be improved by including regular teaching as part of its recognized work. There are very few hospitals devoted exclusively to gynecology and among them none stand higher by virtue of past achievements than the Woman's Hospital. I feel that if it were possible to increase the

amount of teaching that is done an improvement in all departments would follow.

A great problem in gynecology to-day is the problem of properly training young men to become competent in this branch of medical and surgical science. I say medical, because of the need of diagnostic skill and conservatism in treatment, and surgical because of the close relationship between general surgery and gynecological surgery.

Many writers have emphasized the need of a more prolonged period of training as assistants in some surgical hospital before a man should venture to call himself a surgeon and practice as such. This has been especially true in the Mayo Clinic. A similar prolonged period of training is even more essential in gynecology. The problem of furnishing proper training in gynecological diagnosis, in medical and in local treatment, and in gynecological operations is a very real one. It can be solved best in a hospital devoted especially to gynecology. Beginning with diagnosis and medical treatment of ambulatory cases in the Out-Patient Department continued over a period of years, continuing with observations of operative cases that have been previously seen in the Clinic, thus learning exactness of diagnosis, and finally assisting at actual operations and studying in the laboratory the pathology of the various conditions calling for operation, will in the end develop a man really skilled in his specialty. This routine is carried out at the present time to a greater or lesser extent by those attached to the visiting staff, but there is still the problem of the interne unsolved. The latter's too brief experience does not qualify him to practice as a gynecologist and his relations to the hospital could be changed to the benefit of himself and of the hospital. The most evident improvement is a longer service, the latter part of which should be under salary.

In stating the fact that the average general surgeon performs gynecological operations, especially plastic operations, abominably I am only repeating what has been said and written many times. One of the problems that will some day be solved is that of educating the general surgeon to become a better gynecologist. If that can be done he will at least learn to allow his women patients to have the benefit of operation at the hands of those whose specialty it is.

There are many special conditions in which greater knowledge and experience will teach us valuable lessons. While most gynecological conditions are at the present time adequately relieved by operation, there are some that are not. The operative relief of prolapse of the uterus and its complications may be mentioned as one

example.   In the majority of cases the results are fairly satisfactory, in many cases entirely so, but there are likewise many disappointments.   Multiple operations must usually be performed.   Success is due to a proper understanding of the combined causes and appropriate measures for their removal, varying the procedure with almost every case.   This means long experience, good judgment and operative skill.   It will be found that the uterus is almost invariably displaced so that its long axis coincides with the long axis of the vagina.   If this is so, a prolapse inevitably takes place whether there has been any previous laceration or not.   Any operation for its cure must take into account this fact and the axes of the uterus and the pelvic floor so changed in their relations that prolapse does not recur.   The usual procedure will be an amputation of the cervix, at the same time in some cases shortening the uterosacral ligaments as recommended by Grad.   This is followed by an extensive pelvic floor repair, and by a so-called cystocele operation.   The latter, I believe, is often performed when unnecessary.   After this the abdomen is opened and either the round ligaments shortened or the uterus brought forward by some other method.   Personally, I prefer to decide at this time in regard to shortening the uterosacral ligaments, which is done too infrequently.   In the majority of cases the results are excellent and permanent, but this is only so when done by a trained gynecologist. There are some women in whom a really good result cannot be had by plastic work alone.

A discussion of gynecological problems would certainly be incomplete if nothing were said about the greatest problem of all, cancer. The subject is so vast and the literature so great, that it is impossible to do more than mention a very few facts.   One of the most astonishing facts in my personal experience is that I now see so few cases of cancer of the uterus among the ward patients.   This possibly may be merely accidental, but the fact remains that I rarely see an operative case of cancer of the cervix compared to the numbers that I saw a few years ago.   I do see many more precancerous conditions of the cervix and also see many more cases of cancer of the ovary and cancerous involvement of the abdominal organs than I saw a few years ago.   I cannot help feeling that the general public and the general practitioner have been educated so that such cases are recognized both earlier and oftener than formerly.   They are sent to hospitals and promptly operated upon so that the proportion admitted to the Woman's Hospital, at least on my service, is distinctly less than it used to be.

Year by year we advance a little in our knowledge of cancer and its

control. At the present time early recognition and early operation offers the best chance for the patient. The use of radium and of x-ray in conjunction with operation is under trial and promises to improve our results.

A discussion of the best methods of operating is out of place in an article of this kind as it would necessarily be too long. To summarize the more important points, I regard the problems that need solution somewhat as follows:

Some method must be devised to give us better diagnostic skill in gynecology, especially in what may be called medical gynecology and its allied conditions.

Also some method to give us better training in operative work. This can be obtained only by a longer course in special hospitals beginning with the interne service and continuing some system of acting as assistants to experienced operators for a period of years.

Lastly we may expect to improve our ultimate results in such cases as prolapse of the uterus for example, by continued study together with a well-developed system of "following up" our patients for long periods after they have been discharged from the actual service of the hospital.

# THE TOXEMIAS OF PREGNANCY.

BY

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THE subject is such a large one and involves so many irregular symptoms that one can only hope in a brief paper to present some of its manifestations and discuss broad principles of treatment.

There is much in the toxemias occurring in pregnancy that should hold the interest of nearly every branch of medicine. In fact, the internist, urologist, gastroenterologist, dermatologist, physiological chemist, and pathologist have worked and are consulted together with the obstetrician and gynecologist in the treatment of these cases.

But to the general practitioner especially, in whose practice the pregnant woman always figures, the toxemias of pregnancy should be of paramount importance.

Let me cite a few cases. A young woman from three to four months' pregnant begins to vomit, and vomits violently and frequently. In forty-eight hours she becomes very weak. The vomitus is dark, then blood stained. The skin becomes icteric. The temperature at first subnormal, begins to rise. In forty-eight hours she is dead. There has occurred a fulminating case of pernicious vomiting of pregnancy.

Another patient in the latter part of pregnancy has not been feeling well, has slept badly, and had more or less headache with diminished urine and some traces of albumin. With or without a history of some physical overexertion, she has a sudden severe pain referred to her uterus. Examination shows that the uterus is larger than normal for the period of gestation, that it is in tonic contraction and that the fetal heart has ceased to beat. Here is a case of placental separation and extensive hemorrhage due to toxemia.

A young woman near term whose urine had been carefully examined within two weeks and who was supposed to be in a normal condition, retired one evening after eating a hearty meal. About two hours later she woke up complaining of a feeling of oppression. Within half an hour I arrived and found her gasping her last breaths.

In a few moments she died. I opened the abdomen and delivered a fetus whose heart was beating, but I was unable to establish respirations. Examination of a catheterized specimen of urine showed much albumin. The patient had edema extending well up on the legs.

Another woman about seven months pregnant, supposedly well, became semidelirious, then stupid and comatose. Her condition was recognized as serious. She was brought to the hospital and there delivered. The following day she was still comatose and markedly icteric. For several days she passed enormous stools of dark blood. Gradually her symptoms cleared and recovery followed. Here was an extreme case of liver toxemia with hemorrhages.

To the above serious cases we all can add examples of toxemia with convulsions, some with previous warning symptoms and occasional rare cases without noticeable prodromata.

Toxemias of pregnancy generally speaking should include all cases of disturbed metabolism with toxic results associated with gravid condition.

Some of these cases are mild and often unrecognized. Many of their manifestations are diverse. We may include among these tachycardia, syncope, hyperemesis, ptyalism, headache, neuralgias, indigestion, mental depressions and excitation, nervousness, chorea, insanities, and dermatoses such as herpes gravidarum, erythema multiforme, and impetigo herpetiformis.

Our actual knowledge of the causation of toxemia is slight. The growing infant and its influence on maternal metabolism, is in most cases, the basic cause. Even the occasional incidence of postpartum eclampsia does not invalidate this theory. Such an affair would be ascribed to delayed poisoning.

It is true, that some toxic manifestations occur extremely early. An associate of mine has recently delivered a patient at three months for a condition that was patently eclampsia. Thaler and Zuckerman report twelve cases from the literature of eclampsia occurring before the third month.

Hyperemesis is commonly met with by the sixth week of gestation but the extremely toxic form not until a little later.

Toxemia has been reported in cases of hydatidiform mole but in the early development of this disease a fetus is present.

The disturbing element, a protein substance, probably originates in the placenta whence it reaches the woman's circulation. Her failure either to neutralize or eliminate it, starts the poisoning. The uterus itself is not the source of ordinary toxemia. In two

toxic albuminuric pregnancies, I have removed by abdominal section full-term healthy ectopic infants.

Recent studies concerning the origin of toxemia have been focussed along two lines. First there is much investigation concerning an anaphylactic source. A second fruitful line of study seems to be that of the effect of the interrelating glandular activities of the organism. Extensive work has and is being done on the effect of thyroid, suprarenal, ovarian and corpus lutein extracts on toxemia.

At this point it is possible to state more than theory. We know that the individual with defective kidneys, *i.e.*, with chronic nephritis, is a susceptible case, also that the woman with chronic liver disturbance is a probable risk. An improper balance of glandular action furnishes some extreme types of toxemia. Thyroid deficiency is such a cause. In this connection we must admit, however, that pregnancy sometimes stimulates a deficient thyroid gland. We know further that the digestive organs must be efficient. Multiple pregnancy is commonly toxic and is so because of the added strain of the metabolism of two fetuses.

Many a toxic condition begins with some burden on the eliminative organs, overeating, especially of protein diet, a chilling of the skin, the invasion of some infectious disease, too much contact with atmosphere deficient in oxygen, or constipation.

Often an acute explosion is immediately preceded by some one of the conditions just outlined. For example, in the gastric lavages which are given as a routine in all hospital eclampsia cases, we are frequently rewarded by the recovery of the remains of an amazingly substantial meal.

The pathology of lethal cases either from hyperemesis or eclampsia has been found to be very similar. Our most skilled pathologists would now, I believe, hesitate to distinguish between the type of toxemia causing death from the examination of liver sections.

The cases of pernicious vomiting may have a greater tendency to fatty degeneration of the liver and less tendency to hepatic hemorrhages. Those of eclampsia show the presence of fatty degeneration to a less extent and more hemorrhages with a greater liability to necrosis of cells. The kidneys show the change of the so-called kidney of pregnancy, up to that of acute parenchymatous nephritis. Or there may be lesions of a chronic nephritis to which the acute lesion has been added. The fatty degeneration of the heart goes with both type of cases, as does also the edema, hemorrhages and icterus of other parts of the body.

In general we may say that in hyperemesis gravidarum the liver lesions are most pronounced, but that, as pointed out by Dr. Cragin, in the eclampsia cases two types may usually be distinguished both by the symptomatology and the pathology. Namely, those in which the liver disturbance or the kidney disturbance is most marked.

In discussing toxic cases I propose to follow in the description of their symptoms and treatment four classifications. First, mild toxemia; second, hyperemesis gravidarum; third, preëclamptic cases and lastly eclampsia.

The mild cases are significant in as much as they may be premonitory to sudden severe toxemia. They are also the cause of not a little malaise. Some of them are quite responsive to treatment. The symptoms may show headache, drowsiness, fatigue, sleeplessness, or irritability. There is usually associated constipation, indigestion, flatulence and hyperacidity with diminished urine, sometimes showing a trace of albumin and often the presence of indican. Some of these patients are anemic. The blood pressure in the most marked cases ranges to the high limits of normal pressure, i.e., to 130 or more.

Treatment consists in a hygienic method of living. Diet must be closely scrutinized especially as regards the protein intake. There must be plenty of bowel and skin activity and abundance of oxygen.

The fatigue toxins are particularly common in the earlier months and seem often to be associated with the milder hyperemesis cases.

The gastric condition seems to be hyperchlorhydia. Undoubtedly in some of these cases, beginning acidosis exists. Sodium bicarbonate by mouth and by bowel irrigations is efficient. There must be moderate and regular exercise, chiefly walking.

In those cases of vomiting which are obstinate there is much relief secured by a very limited diet. Small amounts of easily digested food are to be taken every two to three hours, with regular meals omitted. Many patients discover this fact for themselves. The extremes of nausea come on after a prolonged fast. Sometimes the evening meal which is a late dinner, following a light luncheon, is the time of greatest distress. The meal is approached with a great distaste for food and is either refused or rejected after eating. The underfeeding then exaggerates the nausea. A tolerance for the dinner may be acquired by taking afternoon tea.

The treatment of these cases may be summarized as follows: frequent light feedings with the avoidance of heavy meals; special

attention to the eliminatory organs; and, for the weakness, periods of recumbency.

Pernicious vomiting is peculiarly liable to occur in the early months but may occur at any time during pregnancy. In the last third of pregnancy a severe toxemia is much more apt to be eclampsia. The onset may be insidious and at first hard to distinguish from the severe form of the ordinary vomiting of pregnancy. But its persistency and severity, in spite of treatment, will establish the diagnosis. Other cases are of more sudden onset. The grave symptoms are so pronounced that interference to terminate gestation is urgent. Beside the vomiting there is epigastric pain, much prostration and first diminshed urine frequently with albumin and a change in the ammonia coefficient. This last gives us a fair evidence of the existence of acidosis and also of the extent of derangement of liver function. Liver disturbance is clearly shown by icterus and gastrointestinal bleedings.

If the case is a slowly progressing one, the pulse becomes weaker. The temperature, at first subnormal, begins to rise. There may be signs of change in the size of the liver, either increase or decrease, and marked liver tenderness. Toward the end coma develops and death follows.

Pernicious vomiting, if not of the fulminating type, may improve under eliminative treatment even to recovery. Nature may terminate pregnancy from exhaustion. And with the death of the fetus symptoms usually disappear even before spontaneous abortion has occurred. The important thing is to recognize the time for interference. If the case is one with rapid onset of severe symptoms, delay is unjustifiable. In some of these cases even prompt emptying of the uterus does not avert the fatal ending.

There is also danger in treating too long the more chronic cases. When icterus is present and yet with scant occasional feedings the patient's condition seems to be maintained about the same, the chance of liver destruction is so great that delayed interference may be too late.

The vomiting is sometimes checked by large doses of bromides by rectum. If even fluids are rejected, all mouth feedings and water should be temporary withdrawn, while rectal feedings alternating with bowel irrigations of bicarbonate of soda solution should be tried.

Hypodermoclysis will also serve to diminish fluid loss and relieve thirst. While this treatment is being maintained the patient must not be allowed access to fluids. Recently one of my patients was

observed to be surreptitiously taking long draughts from the melted contents of an ice-bag.

So often does the severe case of vomiting show sudden recovery, that various remedies have been enthusiastically hailed as effective and often exploited only to give disappointing results. A patient about three months pregnant was in service at the Woman's Hospital recently. About two years previously I had curetted her for her extreme condition due to hyperemesis. After that she had conceived again and developed toxemia, but with remissions which enabled her to go home from the hospital, where she was being treated from time to time. At the sixth month she aborted. During this last pregnancy we tried the injection of corpus luteum extract. Within forty-eight hours the nausea subsided and the ability to retain food returned. Dismissed from the hospital the patient soon returned with her condition as bad as ever. This time there was no prompt response to the luteum therapy, but the condition ultimately improved. On the occasion of her third return to the hospital no luteum was given. Withdrawal of food and irrigations restored her digestive balance. Her next return at about the fifth month was for a spontaneous abortion.

To summarize the treatment of hyperemesis: we should combat the acidosis by promptly diminishing the food, even to the point of withdrawing temporarily all nourishment and even water by mouth, increase the elimination and insure physical and nervous rest. If the vomitus shows presence of blood or there is beginning jaundice with increasing rapidity of pulse, then the time for operative interference has arrived. In fact, exhaustion may indicate the need of this, before all of these symptoms appear.

In emptying the uterus, if the patient is in the first third of pregnancy, dilatation and curettage, at one sitting, is advisable. In the second third a preliminary tamponade of the cervix may be employed. In the last third of pregnancy perhaps an initial softening and opening of the cervix may be accomplished by the use of a cervical bag. In cases where speed is demanded vaginal hysterotomy is the best operative procedure. The indications are to minimize shock and loss of blood, and never in any case of toxemia use chloroform because of its tendency to liver destruction.

The recognition of the preëclamptic toxemia is of the greatest importance to the practitioner. This usually gives time for treatment. It is often possible to cure. Attention to the earliest symptoms may avert a great disaster. The lesser symptoms of toxemia above described become more pronounced. A heavy trace of albu-

min appears.  It may become a definite percentage, with diminished total amount of urine and much diminished urea.  Hyaline and granular casts are present.  Blood pressure increases.  More or less constant headaches are reported.  If the kidney lesions are marked, edema of the legs appears, and this with puffiness about the eyelids are suspicious conditions.  Spots before the eyes, flashes of light or diminished vision may be complained of.  There may be irritability or nervousness or dulness and sleepiness.  Gastro-enteric disturbances are often present and they vary from flatulence and lack of appetite, to marked nausea and vomiting.

The preëclamptic 'case will if untreated end in eclampsia.  Occasionally instead of this termination the condition may pass into a delirium or coma without seizure and with a fatal ending.  Some cases, though profoundly toxic, may pass through labor without quite achieving the explosion.  There are others which terminate by what might be called Nature's cure, namely, the death of the child *in utero*.  This last type of case is especially common where the toxic disturbance is complicated by a defective or previously permanently damaged kidney.  That is, in the cases, which complicate chronic nephritis.  The death of the child may be due to the toxemia.  It is more often due to starvation from a succession of infarcts which destroy much of the placental tissue.  In pronounced cases it is due to the separation of all or parts of the damaged placenta.

It has seemed in my experience that cases of chronic nephritis although showing much albumin and other marked evidences of kidney disturbance, including a very high blood pressure, are not as likely to reach the ultimate stage of actual convulsions as are the uncomplicated acute toxemias.

*Treatment.*—Prophylaxis requires that every obstetrical patient be seen at stated intervals and that she be given proper dietary and other hygenic instruction.  She should be told of the importance of maintaining active kidney action and of regular bowel movements.  Symptoms of toxemia such as headache or edema, she should be instructed to report.  Upon her should be impressed the importance of sending urine specimens for examination at regular intervals.  In cases that are at all suspicious the blood pressure should be taken.  In the case of preëclamptic toxemia most active treatment should be instituted.

The patient must be in bed and allowed only a milk diet.  As much water as possible should be taken by mouth.  Hot packs or the hot-air bath may be employed, and colonic irrigations two or

three times daily. If the examination of the urine and the blood pressure readings show improvement the treatment may be continued. But if, in spite of such energetic treatment, as has been outlined, the symptoms do not improve but grow progressively worse, then ending of the pregnancy should be considered. I believe that this resort would be of especial value in those cases near term where the condition is associated with a chronic nephritis. For these cases are most prone to separation of the placenta and death of the fetus in utero.

Another argument that has been advanced for emptying the uterus in a persistent toxemia is the increased danger of permanent renal damage from prolonged irritation. Again, in cases unresponsive to treatment we are never sure how wide our margin is before the actual occurrence of eclampsia. It is, therefore, the part of good judgment to act promptly where favorable progress under medical treatment is not evident.

The actual occurrence of eclampsia is usually preceded by warning. In perhaps less than 10 per cent. of the cases the prodromata are slight, or at least, of short duration. It is certain that in an occasional case it is impossible for the physician to foresee the catastrophe. The urine usually shows some albumin before the seizure. After the attack it is very diminished, almost smoky in color and full of albumin and casts.

The time of occurrence is before labor in about three-fifths of the cases with the remaining two-fifths about equally divided between intrapartum and postpartum attacks. Severe eye symptoms, headache or neuralgic pains, with mental excitement, or hebetude are sometimes short precursors of an attack.

The convulsions being with a group of muscles sometimes orbital sometimes facial, sometimes of the thumb or fingers. All the muscles of the body quickly take part in the contractions which for about thirty seconds to one minute are largely tonic in character. Then follows for about two minutes the clonic contractions, which are followed by the stage of coma. In the first stage there is cyanosis from contraction of the muscles of respiration and this may increase in the second stage. Occasionally the patient may die in a convulsion from respiratory or cardiac failure. During the coma the breathing is stertorous. A danger of the second or violent convulsive stage is that the patient may injure herself. The tongue unless protected is severely bitten. I have seen the shoulder dislocated by an attack.

The convulsions, depending upon the amount of poisoning, recur

at fairly frequent intervals. Sometimes the patient never clears up at all from her coma before another seizure takes place. Others will become fairly rational and yet revert to convulsions. Where the condition persists, the danger of edema of the lungs is great. For each attack seems to weaken the heart action. In the fatal cases this is the usual cause of death. In the liver type of cases the coma, icterus and hemorrhages are more common.

There is no type of sickness where the indications for treatment are so clean cut as in eclampsia. I would summarize them as follows: First and most important by emptying the uterus with the minimum of shock, to get rid of the source of the poison. Secondly, to sustain the heart and respiration by diminishing the convulsions and relieving the blood pressure. Thirdly, remove the circulating poison in every possible way, that is by stimulating the organs of excretion.

As regards emptying the uterus promptly there are widely diverse opinions. Strogonoff with his policy of temporizing and medical treatment has adduced some excellent statistics and has acquired some followers. If without much shock the uterus can be rapidly emptied this should be done. In other words if there is a dilated or dilatable cervix proceed to deliver. Unfortunately many of these cases are before term and the majority of them are primiparæ with a cervix long and firm. If the fetus is small the vaginal hysterotomy gives us a splendid method of delivery.

The old accouchement forcè in this type of case was a prolonged and bloody procedure. I am convinced that many cases have died of hemorrhage or sepsis from rupture into the broad ligaments.

In the case near term the patient's condition may permit us to temporize by introducing a bag to secure cervical softening and dilatation. After a few hours the cervix may be found in a condition to permit easy operative delivery. In other cases the urgency of the symptoms may demand an abdominal Cesarean section.

The temporary control of the convulsions may be accomplished by a dose of morphine, until other measures can be taken. This is to gain time while preparations for delivery are being made or the patient being transferred to a hospital. If the pulse is rapid and strong, fluid extract of veratrum viridi, mm. 4 may be used hypodermically, and repeated in four hours. The effect of the drug must be carefully observed, as it is very depressant. Chloral hydrate grains 30 by rectum and then grains 10 every three hours seems to have a quieting effect. Nitroglycerine grain $\frac{1}{100}$ every hour by hypodermic also has a beneficial effect on the blood pres-

sure. As far as possible all external stimuli such as sudden noise or light should be avoided.

It was formerly a rule to administer chloroform if the patient became restless or in case any manipulation, such as catheterization, was to be undertaken. I can recall such patients watched by a special nurse, who was instructed to give chloroform on the slightest indication. Undoubtedly such a measure was very harmful. During the seizure it was customary to give chloroform. It is now recognized that no anesthetic will stop the seizure once it has begun. The proper treatment in that emergency is to prevent injury to the tongue, keep the patient from falling off the bed or table and see that respiration is resumed. The early administration of oxygen is of some help in clearing up the cyanosis.

To remove the toxins the following methods are available. As soon as possible wash out the stomach and introduce by stomach tube 5 grains of calomel with ½ ounce of Epsom salts or 1 ounce of castor oil. Follow this up by colon irrigation with saline or bicarbonate of soda solution. By this method we clear out toxins from the intestines, increase peristalsis and permit the absorption of fluids, thus stimulating the kidneys. The irrigations may be used as often as three times a day. Bleeding followed by intravenous injection of saline may be employed in sthenic cases. But in putting solution in the blood we must remember the tendency to pulmonary edema and the amount must be limited.

A moderate bleeding at the time of delivery will usually serve the purpose of blood letting. After twenty-four hours the hot pack or hot-air bath is valuable. Used in earlier periods it has seemed to me to have a depressing effect upon the heart. The administration of oxygen at intervals is very beneficial both by aiding the heart action and assisting elimination.

If coma persists, catheterization must be employed every six hours in order that the renal action may be under observation. It is further claimed that the empty bladded stimulates the kidneys.

There remains the duty of watching the heart action and supplying necessary stimulations. Beginning pulmonary edema demands active treatment and counterirritation by dry cupping over the chest.

As soon as the patient becomes partly rational she must be urged to drink water freely. Sometimes coma is prolonged and the tendency to convulsion persists. But these are cases it pays to fight for, and some very discouraging ones do manage to pull through.

With the improvement of the symptoms, the energetic treatment must be lessened but not entirely omitted until the patient is rational and the kidneys are acting freely. Even then the diet must be increased with exceeding caution depending upon the condition of the urine. If the baby is alive it is not wise to put it to the breast until several days after the mother's toxemia has disappeared.

Eclampsia if treated along the lines indicated above should give a mortality of not more than 10 per cent. It does seem at times that treated alike one series will be more fatal than at other times. This, however, applies to hospital cases where many have been previously neglected in their antepartum care. The present agitation to diminish infantile mortality by providing proper prenatal care for the poor will have its greatest benefit in recognizing early toxemia and in the prevention of its extreme types.

# ILEUS FOLLOWING GYNECOLOGICAL LAPAROTOMIES.

BY

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THE significance of inhibited peristalsis following laparotomy frequently is overlooked in postoperative treatment.   Unless evident paresis or obstruction exists, postoperative meteorism is not, as a rule, a cause for alarm.   Most surgeons agree that after every laparotomy there is always some paralysis of peristalsis; it is expected and, therefore, attracts little attention aside from administration, at times, of an opiate to relieve suffering.   Bier emphatically states that postoperative ileus in some degree occurs during the first forty-eight hours after all laparotomies as a combined result of drying-out, cooling, mechanical or chemical irritation, or slight infection; and according to Krönig, it is never entirely absent.   In regard to these conditions, there seems to be on the part of operators a tendency to assume the existence of an element of fatalism and they do not act until serious symptoms develop, as a result of which their patients suffer torture for from twenty-four to forty-eight hours.   Finkelstein says that postoperative intestinal paralyses which follow major laparotomies are more frequent after gynecological operations, probably because of pelvic adhesions, the longer time required to operate, and the greater exposure to air.

The writer believes that intestinal distention coming on after operation should be regarded as a serious complication and treated as such from the beginning; that it should be classed with shock, hemorrhage, etc., as a condition demanding careful therapeusis. In his opinion, there is no doubt that many cases of severe ileus might have been prevented had the first signs of peristaltic interference been heeded and appropriate measures adopted to combat it.

"This ordinary immediate ileus," says Bier, "is, as a rule, harmless and passes away on the third day, but may persist and cause death." It is persistence that renders the condition dangerous. Although it usually is harmless, it is always the cause of much suffering and agony which must exert an unfavorable influence upon the nervous system of the patient and retard convalescence.

In a monograph upon his theory of anoci association, Crile says that postoperative distention can be explained as a biological adaptation to overcome infection; that in the course of evolution all abdominal penetrations are infective, but the peritoneum is able to overcome most infections if they can be localized.   Nature, having no confidence in the surgeon, distends the coils of intestine against the abdominal walls, thereby shutting off any attempt of the infection to spread.   This tenet, the writer believes, is unsubstantiated. In fact, farther on in the same article, Crile asserts that his nerve-blocking method does away with the abdominal distention and attendant pain and thus is a very great surgical improvement.   He says: "The postoperative rise of temperature, the acceleration of the pulse, the pain, the nausea and distention are minimized or wholly prevented."

Postoperative ileus should be recognized as a disease entity, from the beginning, as G. Schubert points out.   If the serious phenomena are to be recognized and guarded against, the milder phases cannot be overlooked or neglected.

Generally speaking, postoperative ileus is that which occurs within ten or fourteen days after operation.   When it occurs later it is always due, as Elliott says, to obstruction and is so distinct in its manifestations and serious in its aspect that it readily is recognized.   Early ileus frequently is so insidious in onset, so prone to combine one or more types that most writers in dealing with this condition draw the line rather sharply between it and the late form.

There are two main factors that enter into the etiology of ileus, which may be called the indirect and the direct causes.   By indirect is meant the idiosyncrasies of the patient, her nervous make-up and her habits.   It is a fact attested by de Francisco, Zadradincky, Tansini, and others, that certain women seem to have an idiosyncrasy for the formation of adhesion and for ileus.   Tansini describes a case in which he performed a nephropexy twice at different times and a paralytic ileus of an alarming degree appeared both times. Most operators have had the opportunity to observe the facility with which in some patients adhesions form after simple aseptic operations.   The writer recalls a patient upon whom he operated four times for adhesions, each time in different parts of the abdomen, the primary operation being undertaken for the removal of an interval appendix.   It is believed generally by medical men that the presence of a chronic lesion, such as tuberculosis, acting as a cause of faulty metabolism, predisposes to atypical peristalsis and renders the abdominal serosa susceptible to very slight trauma.

Hysterical patients sometimes develop a spastic type of ileus which may cause grave concern to the surgeon. In these cases, however, there usually is no change in the pulse rate or cardiac activity, a dose or two of bromide relieving the condition.

Constipation, to which the majority of women seeking surgical treatment are subject, is a predisposing cause of ileus. The bowel torpidity may be due to the patient's failure to respond to the call of nature or to adhesive bands, kinks, membranes, and the like. A bowel, the musculature of which thus has become weakened and sluggish, very quickly responds to peristaltic inhibition.

The direct causes are such as arise from operative procedures. Nature resents any violation of the abdominal cavity. No matter how slight the unavoidable or avoidable trauma, the sensitive peritoneum reacts to the irritation when the abdomen is open. The usual postoperative reaction is caused by cooling and drying of exposed intestinal serosa by the air, by the more or less handling of the viscera, by the use of pads, sponges, etc., by slight infections from faulty technic, and by adherence of intestinal walls to abraded surfaces, ligature knots, or stumps. The rôle of narcosis in the production of ileus is a subject of much discussion, many writers giving this as one of the causes, others claiming that its effect has been greatly exaggerated. While clinical evidence seems to support the affirmative view, the manner in which narcosis acts in the causation of intestinal paralysis is not very clearly understood. In an exhaustive article on acute dilation of the stomach, G. A. Friedman claims that narcosis produces splanchnic paralysis by action upon the nucleus in the floor of the fourth ventricle. More advanced views, however, point to interference by narcosis with the interglandular action of the chromaffin system, especially that of the adrenals, which seem to exert direct action upon the abdominal sympathetic nerves. As soon as the anesthetic is withdrawn interference ceases, which tends to prove that the more prolonged the narcosis the greater the adverse action of the controlling influences.

Hastie and Monat have pointed out that asphyxia causes intestinal anemia, lessening intestinal activity. With this view Nothnagel agrees and explains the phenomena by saying that the dyspneic blood increases the peristaltic action, thus tiring the intestinal musculature and favoring ileus. Crile says that ether immediately impairs the immunity of the patient by interfering with cellular oxidation.

The writer made a careful study of forty operative cases with the

view to determine, if possible, what effect, if any, varying length of time of narcosis had on the presence of postoperative distention. The operations varied in time for from fifteen to ninety minutes, all possible care being taken to avoid intraabdominal trauma. The result of this study conclusively showed that the shorter the time of narcosis the less the distention, the comparative cases being carefully selected.

Whether the nerve shock, as described by Crile, has an inhibiting effect on peristalsis, is not universally acknowledged. In a series of twenty cases in which the anoci association method was used in conjunction with gas-oxygen and gas-oxygen-ether narcosis, little appreciable diminution in distention was noticed, but there was far less pain. Of course, this lack of result may have been due to faulty technic.

The usual or harmless form of ileus may be the forerunner of the more serious type. The latter may be ushered in very gradually, beginning immediately after operation. For this reason alone, it is wise to take precautions in the earliest stages, for the same reason that tonsillitis should be differentiated from diphtheria.

Severe ileus is not very uncommon. It occurs in about 1 per cent. of all laparotomies. Some writers give the percentage as high as 6 per cent. Thiemann reports 3 per cent. Klotz saw thirty-one cases in 569 gynecological operations. Döderlein and Krönig, in 2000 cases at the Tübingen Clinic, saw twenty-four cases. The writer, in 340 laparotomies, saw five. These percentages represent a very grave source of danger following laparotomies.

Severe ileus has been classified as dynamic or paralytic and mechanical, according as the cause is splanchnic paralysis or obstruction to emptying of the bowel. Vaccari claims that all cases of ileus are due to either peritonitis or obstruction. He does not recognize the spastic type. The two types, as a rule, have distinct symptoms, but sometimes resemble each other so closely that differentiation is impossible. From the academic standpoint, the fine distinction of type is enlightening, but therapeutically it is apt to obscure the vital issue and lead to dangerous procrastination.

Paralytic or dynamic ileus results from sympathetic paralysis, induced by peritonitis, mechanical irritation of intestinal musculature or peritoneum, such as is caused by rough handling, traumatism, or chemicals, by improperly prepared or applied pads, by too much dry sponging and by eventration. Stumpf and Freund emphasize eventration as a cause of intestinal paresis. Circulatory engorgement caused by wounding a blood-vessel in the intestinal wall, and

injury to the mesenteric vessels causing thrombosis, infarcts, etc., which may be caused by severe traction on the mesentery by rough handling, placing of pads and the long-continued Trendelenburg position are contributing causes. Kuskat, Craig, and Trendelenburg himself assert that the last mentioned may induce ileus.

Spastic ileus, which is dynamic in character, usually occurs in hysterical women and in cases of lead poisoning. It rarely occurs postoperatively. Some writers ignore this type completely in dealing with postoperative ileus. Döderlein states that spastic ileus is denied on good authority, but its occasional occurrence is still authenticated. It is known to occur in the predisposed and under certain irritations, such as gall-stones.

Sandos and Sterling, in their physiology, say: that all stimuli may even produce spasmodic contracture of the musculature of the intestine.

Baldy reports two cases after hysterectomy, the autopsies showing no peritonitis, but intestines contracted in one or two places. Experiments have shown that stimulation of the splanchnic plexuses of Auerbach and Meissner causes increased peristalsis, while over-stimulation causes spasmodic contracture. Spastic ileus attacks, by preference, the colon, but may affect the ileum. Bunge, at the German Surgical Congress, 1908, reported two cases of spastic ileus. The first case occurred after an operation for appendicitis. Re-laparotomy showed the entire colon in spastic contraction. An ileostomy was done and the patient recovered. In the second case, the contraction extended up the ileum for 30 or 40 centimeters. Spastic ileus is very hard to differentiate, but presents characteristic symptoms of intestinal paresis. The mechanical type of severe ileus is due to adhesions of gut to gut, of gut to the abraded surfaces, such as a stump, a denuded area, such as is left after separating pus tubes, etc., ligature sites, or to a band of adhesions across the lumen. A loop of intestines caught in a rent of the omentum or mesentery, or between two constricting bands, if not released, is apt to produce the characteristic ileus.

Drainage devices may produce reflex disturbances of peristalsis, which promptly subside after removal of the drain. Other foreign bodies, such as gauze, tampons, etc., left in the cavity, may produce paralysis.

Arteriomesenteric ileus is one of the most dreaded postoperative complications. It has been called Riedel's syndrome or acute dilation of the stomach. As a rule, this is not described under postoperative ileus, it being a disease by itself. The etiology is obscure,

although it is generally supposed that it is caused by closure of the duodenum by the constricting effect of the superior mesenteric artery and the mesentery between which the duodenum is caught. Some writers claim that the constricting of the duodenum is the result and not the cause of the dilation. While this accident is very serious, it lends itself usually to speedy relief, if recognition and treatment are early.

The etiological factors of severe ileus may be epitomized as follows:

1. Mechanical irritation of the peritoneum and intestine during operation.

2. Infections of the peritoneum.

3. Adhesions of intestinal loop to abraded surfaces or to adhesion strands.

4. Closure of mesenteric vessels.

The diagnosis of ileus is made by the presence of abdominal distention, local or general, by the failure of the bowel to expel gas or feces, and by vomiting. Pain, while always present in the first stages of intestinal occlusion, may be entirely absent in the severest forms, especially in the paralytic forms. In fact, if pain, usually present immediately after operation, disappears and the distention persists, it is good evidence of more or less severe paralysis. Even if the bowels have expelled gas or feces, or both, and distention persists, there is danger of grave sequelæ.

Every postoperative distention should be viewed with suspicion. Its course should be watched, hour by hour. It is only by so doing that the severity of the condition can be determined. In general, it may be said that the paralytic form, which includes the irritative, spastic, and septic types, appears in the first three days after operation and the mechanical form, after gas and feces have escaped. Sometimes, however, both forms appear together, which makes differential diagnosis difficult.

The paralytic form is manifested by gradual increase in the meteorism and failure of the bowels to expel gas or feces. Vomiting soon supervenes and increases in frequency; there is an increase in the pulse rate, which soon loses its normal character and becomes weaker and thready, depending on the degree of toxemia. Döderlein and Krönig say that there may not be any rise in temperature, as the toxins may not affect the heat center. On the other hand, they do affect the vasomotor center, which they paralyze and cause the rapid thready pulse. As a rule, ileus is accompanied with some rise of temperature.

The typical symptom-complex would be as follows: After shock

has disappeared and the patient feels better, with a fair pulse, the temperature and also the pulse rate rise, and the patient begins again to feel ill; the abdomen is tympanitic, the stomach feels distended, and gas does not pass from the bowel. Vomiting soon begins, and consists, at first, of stomach contents, then bile-tinged fluids, and, if the condition is not relieved, fecal-stained material. The condition becomes worse, especially as regards cardiac activity, due not only to toxemia but to pressing upward of the diaphragm by the distended bowels.

Obstructive ileus may occur as early as the third day, though, as a rule, it does not develop until the sixth to the tenth day. In the early stages, there is exaggerated peristalsis—which frequently can be seen if the abdominal wall is thin—resulting from an attempt of nature to force by the obstruction. Auscultation and also the increased borborygmi reveal this. A tumor at the site of the obstruction may be felt and there is generally tenderness over the wound. This last is particularly true of colonic obstruction, although the reverse is true with an obturation of the ileum. The clinical picture of cecal obstruction is identical with that low down in the ileum. Colonic obstruction sets in slowly and does not always cause vomiting at first. Meteorism may not develop for five or six days. Usually there is little circulatory or febrile reaction. On the other hand, obstruction of the small intestine in the upper ileum or jejunum shows early a decided effect on the pulse rate, with or without much fever, and vomiting is an early feature. There is not so much meteorism, as there is not so much intestine involved.

In obstruction of the lower ileum, the symptoms vary as the obstruction approaches the colon or jejunum.

The writer believes that a severe ileus should always be suspected if, after recovery from the effects of the anesthetic, vomiting continues or again begins, accompanied by abdominal distention. There may be no change in the pulse rate, as that may have been increased by the effects of the operation or the general lowered vitality. Many writers emphasize the importance of differentiating the paralytic from the obstructive form, and it is not rare to see a case of undetermined character develop beyond the point where life may be saved.

The pathological conception of ileus, according to text-books and many writers, follows the natural road of clinical findings without the benefit of laboratory research or animal experimentation. In a great measure, autopsy findings have corroborated the clinical evidence. It is with this conception that many authors strongly

assert the importance of making the differential diagnosis of the two forms, some writers declaring that surgical interference in paralytic ileus is unwarranted.

The classical pathological picture of obstructive ileus starts with occlusion of the lumen of the viscus, which is followed by increased peristalsis. Meanwhile, the contents of the bowel accumulate and, being prevented from escaping, increasingly distend the lumen until the obstruction is relieved or death ensues. This distention produces a thinning of the bowel wall with emigration of bacteria into the peritoneal cavity, causing a peritonitis from which toxins are absorbed. Sometimes ulcers form in the mucosa and break through into the abdominal cavity. In the distended loops, fecal material decomposes and toxic material is elaborated which, being absorbed, causes dangerous toxemia.

In the paralytic form, the putrefying feces or the presence of a septic peritonitis is believed to be the cause of death.

Krönig says that after fecal stasis, fermentative products of a toxic character are formed and absorbed, and that after prolonged operations or in weakened organisms these toxins are sufficient to cause death. All through the literature, absorption from septic peritonitis and fecal decomposition are advanced as the chief cause of death. G. Schubert says that it is doubtful if paralytic ileus itself ever causes death, that the death is due to complicating sepsis.

While agreeing with the pathological conditions described above, the writer believes that the most potent factor in the production of toxemia is not the septic process or the emanation from putrefying feces, but an autogenous toxemia resulting from toxins far more poisonous than the bacterial or fermentative toxins, elaborated from the blood by the cells of the mucosa of the upper segments of the small intestine. In every serious or fatal case, the upper bowel is always involved, and it is here, experiments have shown, that a very toxic material is elaborated if distal drainage is occluded. This toxin secretion is made possible by dehydration from vomiting and, perhaps, the lack of internal secretion control.

Whipple, Stone, and Bernheim (*Jour. Exp. Med.*, xix, 144, 1914) in an article on intestinal obstruction, speaking of the defensive mechanism against duodenal loop poisoning, say: "Intoxication is evident in a drained duodenal loop, whether it opens externally or into the jejunum and may be associated with more or less immunity which can be demonstrated after a period of days. Intoxication with a closed loop is identical whether the loop is left empty at operation or filled with a lethal dose of loop fluid. This emphasizes the

fact that absorption of the poison is essentially from the mucous membrane rather than from the contents of the closed loop. Cessation of the normal flow of intestinal fluids which bathe the mucous membrane may be essentially responsible for the perverted activity of the mucosa and the secretion of a poisonous material."

Hartwell, Hoguet, and Beekman (*Arch. of Int. Med.*, xiii, 701, 1914) say that if the upper segment (of the bowel) has become damaged, poisonous absorption is threatened, and a drainage enterostomy should at once be performed, in advance of the relief of the ileus.

Clairmont and Rainizi, quoted by Finney, injected filtrates from normal unobstructed intestines into guinea-pigs, and perceived no toxic results. They then injected pathological fluids from obstructed intestines and found they were profoundly toxic and lethal. The fluids from the colon were not as poisonous as those from the small intestine. Hartwell, in some experiments on dogs with bowels artificially obstructed, found that by subcutaneous injection of saline these dogs were kept alive and well for twenty-four days. When they were killed, autopsy showed no pathological lesion except dilation above the ligature. Draper (Maury) found, experimentally, that by feeding normal mucosa cells from the intestines of a well dog to dogs with obstructed bowels he was able to keep them alive and well.

Moraselis, Ruis, and Natale, quoted by Draper, showed conclusively by injection into rabbits that intestinal contents from an obstructed segment of intestine become less toxic directly the obstruction neared the rectum. Duodenal contents were most toxic, and the sigmoid contents least so. This is attributed to the symbiotic action of the bacteria in the lower bowel.

Cases of fecal vomiting frequently are seen which, as soon as the obstruction is removed and drainage established, promptly recover (F. Wood). This is well illustrated by the following case:

Mrs. P., aged forty-eight, was operated on by the writer at the Woman's Hospital, October 3, 1914, for pelvic adhesions and partially obstructed sigmoid, as shown by the röentgenograph. She made a good recovery from the anesthetic, her temperature at 8.00 P. M., being 99.3°, pulse 82, respiration 22. During the night she was somewhat restless. There was only slight abdominal distention. Morphine, grain ¼ by hypo. was given and she slept well until 2.30 A. M., when she awoke and complained of pain in the abdomen. The rest of the night she slept at short intervals but was more or less restless. On the morning of the 4th, she felt fairly well, but complained of nausea. She was given water by the mouth, which did not increase the nausea nor cause vomiting. Her temperature at 8.00 P. M. was 100°, pulse 92, respiration 22. On the 5th, the

temperature dropped to normal, pulse 88, respiration 22. There was quite marked meteorism, accompanied with more or less discomfort. The urine was negative  At one o'clock of the 6th, the pain was worse, a little watery fluid was vomited, after which some relief was felt. An enema given was expelled without gas. The rectal tube was inserted for twenty minutes, with relief. At 6.00 A. M., enemata of oil and turpentine followed by soapsuds were given, which she expelled immediately. At 8.30, vomiting began and continued about every half hour. Hot water was given by mouth and retained. The abdominal distention was apparently increasing. The emesis continued; a large, hot flaxseed poultice was placed over the abdomen. The pulse at 8.00 A. M. was 120; at 12.00, it was 130. The temperature showed only a slight rise to 101°. Vomiting of greenish fluid continued about every fifteen minutes. An enema of milk and molasses, of each a half pint, was given without relief. The rectal tube brought away no gas. At midnight, the pulse was 145, temperature 101°, respiration 28. A diagnosis of ileus was made and the patient was taken to the operating room and given a quarter of a grain of morphine and a hundredth of hyoscin. The abdomen was opened through the operative wound and a diffuse peritonitis was found extending all through the pelvis and the lower part of the abdomen. The patient's condition was not good, so a loop of upper ileum or jejunum was brought up and sutured into the wound, then opened and a No. 30 rubber tube inserted into the proximal segment. Two gauze drains were inserted down into the pelvis. The time of operation was fifteen minutes. At 8.00 A. M., the morning of the 7th, the patient's temperature was 98.3°, pulse 130, respiration 24. Vomiting and pain had ceased. At 8.00 P. M., same day, the temperature was 98.2°, pulse 100, respiration 24. Recovery was uninterrupted, the enterostomy wound being closed later.

While the enterostomy wound was open the patient rapidly lost flesh and strength through starvation, though rectal and tube feeding, carried out carefully at two-hour intervals and in small quantities, arrested this somewhat. After the fistula was closed the lost strength and flesh were rapidly regained.

W. W. Grant (*Surg., Gyn. & Obst.*, April, 1915) describes two cases in which the same procedure was followed, namely, enterostomy, with immediate relief but a fatal outcome. He operated on the third and fifth day after obstruction, before which time lethal doses of toxin may have been absorbed from the upper intestine.

Gurb, of Montreal, believes that since the mucosa of the upper bowel contains a greater content of toxic principle than do the contents of the lumen, it would seem that the poison is produced by autolysis rather than by bacteria. Roger believes in the autogenous origin of obstructive toxemias, and says: "Emancipation from the text-book dogmas of nervous influences, shock, stagnation of bowel contents, passage of bacteria and bacterial products through

the stretched wall 'as the cause of toxemia" is very necessary. He says these should be set aside in favor of modern conceptions of glandular interaction, interference with which probably is the fundamental cause of obstructive death.

Draper (Maury), in another article, says that dogs will live for weeks with iliac obstruction, but die in a few hours with duodenal obstruction, and the same dog will live for weeks if there is the slightest drainage of the duodenum. In ileocolic obstruction, the danger lies in the sequence of peritonitis, which produces not only its own ;toxins but, by paralyzing the whole gut, induces the vicious secretion of the upper coils.

Granting that any postoperative distention is pathological and as such should be considered worthy of every attention, the prophylaxis assumes great importance. The preoperative preparation should consist of careful regulation of the bowels, without purges, etc., some days before operation. Purging, or even milder catharsis, just before operation is to be condemned. An enema or two the night before is sufficient. Some operators advise against even an enema twenty-four hours before operation. The writer's method of giving a laxative two or three days before operation and an enema the night before has acted very satisfactorily. In emergency cases, no enemata are given. The nervous or hysterical patient should, as far as possible, be guarded against the worry of distressing anticipation by the judicious use of bromides for a few days. A little morphine or morphine and hyoscine, given just before she is taken to the operating room, not only frees her from the horror of the last few moments before operation, but minimizes the amount of anesthetic needed. Crile lays great stress on the effect of emotional stimuli on the brain. The less anesthetic employed, the less the liability to narcosis depression. There is no doubt that the shorter the time of operation, the fewer bad effects will follow. This applies not only to the narcosis and the natural surgical shock, but to the length of time the abdominal contents are exposed to the air. Many writers emphasize the necessity of avoidance, as far as possible, of contact by the intestines and peritoneum with the air and chemical substances. Overlarge incisions always invite splanchnic irritation. The smaller the incision, the less the exposure. Many operators scoff at the small incision, but the writer believes that operative technic will never approach the ideal until the smallest possible incision through which the work readily and safely can be done, is universally adopted. The whole abdominal cavity can be explored through a three- or four-inch incision. The

writer saw one of the most noted and publicly acclaimed surgeons make an incision for the removal of the uterus and two ovarian cysts, the larger of which was about the size of a grapefruit, which extended from $\frac{1}{2}$ inch below the ensiform cartilage to the pubes. When asked why such a large incision was made, he replied he wanted plenty of room. The patient died of shock. The same surgeon, operating in the upper abdomen, where he was most adept, never made an incision over 3 or 4 inches long.

Except for cauterizing, chemicals are never used in contact with the peritoneum, but the prevalent use of iodine in the preparation of the abdomen has brought the danger of intestinal irritation when the gut comes in contact with the skin. Rehn, quoted by Bier, first drew attention to the irritative effect of iodine on serous surfaces. It is, therefore, important to cover the skin by pads or towels held in place by clamps or pins.

Rough handling of the bowel is to be avoided at all times. Ther is no condition which demands maltreatment of the intestines This applies especially to the preparation and use of abdominal pads Dry pads should never be used; thin pads are bad because the water evaporates quickly and they are liable to chill the gut. Thick, warm pads, moistened in saline, are best. Pads roughly shoved in through the incision to keep back the intestines, not only irritate the sensitive serosa, but may produce injury to the mesentery, resulting in venous or arterial occlusion.

One of the most difficult problems before the surgeon to-day is to prevent adhesions. Thiemann says: "We know of one resource only for preventing adhesions, to wit, keeping up the peristalsis from the earliest moment." He also says that if the various substances which have been applied to the peritoneum, prevent adhesions, it is very likely because they stimulate peristalsis. He goes so far as to advocate opening the abdomen after all postoperative inflammatory disturbances have subsided and dividing all bands.

The covering of all raw surfaces, stumps, ligature-knots, and suture lines, were it possible, would go far to prevent the formation of adhesions. But this is not always possible, so the problem really resolves itself into the necessity of keeping up peristalsis from the very first.

The use of olive or cotton-seed oil, liquid vaseline, animal oils, and the like, have proved rather unsatisfactory in seventy-five of the writer's cases. Some operators use a Cargile membrane with good results, but it is very hard to apply and many surfaces do not lend themselves to complete covering. Transplanting of omentum

to cover raw places, as recommended by A. T. Mann, of Minneapolis, and others, has proved of value in some hands.

The stimulation of peristalsis immediately after operation has received a great deal of attention for a number of years. Of the drugs most highly acclaimed, atropine and physostigmine lead. Vogel, Bier, Zadradnicky, and others, praise physostigmine above all drugs. While there is no doubt that this drug and atropine do act well in some cases, their action is uncertain and bad after-effects have been reported.

Simoncelli and others have used the preparation called "Peristaltic Hormonal," introduced by Zuelzer, with marked effect. This preparation, however, has a pronounced effect in lowering the blood pressure and must be used with great care. Deaths after its use have been reported.

The direct injection of castor oil and Epsom salts into the bowel has few advocates now.

The writer has been using a water-soluble glucoside from cascara sagrada, recommended by K. Finkelstein (*Deutsch. Med. Wochenschr.*, December 17, 1914) in twelve cases. These cases included three pus tubes with exudates, four supravaginal hysterectomies, one case of adeno-carcinoma of the uterine body, two cases of retroflexion of the uterus, and two of appendicitis. With the exception of one case, all had more or less adhesions. The result of the treatment has been very startling. None of the cases had marked distention. Two of the pus tube cases had some distention, but passed gas naturally at the end of twenty-four hours. The drug was administered hypodermatically before the patient left the operating table, the dose being 1 ampule of 0.5 gm. This dose was repeated every six hours, until gas was passed. Of course, twelve cases are insufficient from which to draw any definite conclusions, but the decided results obtained warrant continued trial.

The treatment of ileus after it has once set in consists of, first, an attempt to excite peristalsis strong enough to produce an evacuation by medical means; and then, if failure ensues, to relaparotomize for drainage and, if possible, the relief of the obstruction.

The writer believes that measures to relieve distention should be instituted at the end of twenty-four hours if gas has not passed the anus. The usual custom of allowing a distended abdomen to persist for two to four days is very hazardous. If there is no meteorism, it does no harm to wait two or three days before moving the bowels. Cathartics and the like are not demanded, but enemata consisting of glycerine, soapsuds preceded by oil, and turpentine, should be

tried first.   Other mixtures, such as milk and molasses, equal parts, have been used successfully.   Oxygen gas, introduced per rectum, has, in the writer's hands, proved very valuable, acting by stimulation of the nerve endings and also by the mechanical effect of straightening agglutinated coils.   The abdominal application of hot poultices and Gelinsky's hot-air baths, have proved of great aid, especially if peritonitis be present.   The writer has used the cluster of electric light bulbs with very satisfactory results in certain cases. Pettenkofer uses galvanic electrical enemata, as recommended by French authors.   As slowed peristalsis is favored by the recumbent position, it is important to insist on the frequent change in position of the patient, by turning her from side to side, or tipping the bed. The knee-chest position has been used to relieve a kink or a twist in the intestines.   These body movements also tend to prevent adhesions.   Gentle massage to the abdomen has been recommended, but is of doubtful value on account of the discomfort to the patient.

If, in spite of all efforts, the ileus is not relieved, relaparotomy must be considered, some authors say as early as two days, others say, by the fifth day.   Relaparotomy is a very grave procedure and becomes graver the longer the ileus has persisted.   It is a question whether the seriousness of the reoperation is not brought about by the tendency of the surgeon to wait too long.

The writer believes that if during the first forty-eight hours the patient's bowels become distended, causing pain, no gas passes the anus and vomiting is present, with an increasing pulse rate, the diagnosis of ileus should be made at once and an attempt made to open the bowels.   If ineffectual after twelve to twenty-four hours, relaparotomy should be done.   Increasing vomiting and pulse rate are signals that should be obeyed at once.   If the ileus is relieved, before the so-called fecal vomiting is noticed, the chances of recovery are very excellent.   After fecal vomiting has begun, toxic absorption also is going on, and the prognosis grows graver as the time slips by.

After the abdomen has been opened, the type of ileus reveals itself.   If it is septic, an ileostomy or low jejunostomy should be done at the same time the septic condition is treated.   The sooner out of such an abdomen, the better the chances of the patient. Simple puncture of the bowel does no good, for the gas is not the offending agent.   Spastic ileus is always treated by ileostomy.   If the ileus is obstructive and the patient's condition permits the time, a search for the obstruction should be made and the obturation relieved.   As a rule, these cases are in a pretty low state of vitality, not only from the effects of the ileus, but from the primary operation and it is a grave question whether it is good surgery to expose the patient to the shock of handling the intestines in searching for the lesion, or of a resection, however cleverly done.   Far better is it

to drain off the toxic products and wait until later for the radical work.

In the light of the autogenetic hypothesis, the efficacy of an early ileostomy must be recognized. It is an axiom of surgery that the earlier a lesion is attacked the more favorable the prognosis. Ileus is the germinal bud which, if allowed to grow and blossom bears a very deadly fruit. It is the bud of the early manifestation of intestinal paresis that must be attacked, not necessarily by operation, to ensure the patient's safety. If operation is the only resource, is should be aimed at the root and done in the quickest possible time.

In conclusion, the writer would summarize as follows:

1. That the postoperative distention which is nearly always present is likely to be a signal of danger and not a condition to be ignored.

2. That differential diagnosis is not sufficiently important to demand even one hour of delay in therapeusis.

3. That the greatest source of danger in ileus is the vicious secretion of the upper small intestine caused by the failure of glandular interaction and dehydration by vomiting.

4. That a strict prophylaxis includes preoperative care as well as most careful attention to perfect technic at operation.

5. That early treatment at the end of twenty-four hours is indicated and early operation if nonoperative measures fail.

6. That the upper bowel should always be drained and not merely punctured, the radical cure being postponed unless the patient's condition allows an extended operation.

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# STATISTICAL STUDY OF ONE HUNDRED CASES OF PYOSALPINX.

BY

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ONE hundred cases of pyosalpingitis which were operated on by the various members of the Surgical Staff and taken from the records of the Woman's Hospital, form the basis of this communication. They include all classes of cases of pyosalpingitis from the mild cases to those suffering with profound septic intoxication. The types of operations performed on these cases differ greatly. In some cases the operation consisted of drainage of the septic focus alone, while in others, total ablation of all the pelvic organs was done.

Clinically pyosalpingitis may be divided into three great classes.

    I. Acute purulent salpingitis.
    II. Subacute purulent salpingitis.
    III. Acute recurrent purulent salpingitis.

In the study of these 100 cases no attempt is made to group them according to this classification, but from a clinical point the above classification is not only of interest, but of practical value. In a study of these 100 cases only the surgical aspect of the cases will be considered. No attempt will be made to take into consideration the remote recovery of the patient. The condition of the patient at the time of her leaving the hospital only will be considered.

The above classification of pyosalpingitis cases is of clinical value because they can thus be easily distinguished at the bedside of the patient. In the acute cases we have the history of infection of the genital tract of recent date, we have the history of an acute onset with abdominal pain which is at times very severe, and great tenderness, a rise of temperature and pulse, the chills, the sweats, the prostration—all of which point to the acuteness of the inflammatory reaction. In these acute cases the subjective symptoms are overwhelming, while the objective are very few and sometimes *nil*. In some cases the infective agent can be demonstrated while in others it cannot. The lower abdomen is tender on palpation and bimanually very little can be felt. Palpation gives the woman

lots of pain and gives the diagnostician very little information. It is, however, not difficult to diagnosticate these cases of acute pyosalpingitis from the symptoms enumerated above.

In subacute pyosalpingitis we have a series of symptoms and signs which lead to a ready diagnosis. This class starts off with milder symptoms than the acute cases and the physician finds that the illness extends over a long period of time. The inflammatory reaction is not so acute, the patient may state that with her illness she has never been confined to bed more than a few days at a time, but while the pelvic pain is not acute it is very persistent. These patients are seldom without pain. When the pain ceases there is still pelvic discomfort. The cases are treated locally with amelioration of symptoms, but the suffering continues. Every general practitioner sees many of these cases and the variety of local treatments they undergo is legion. All the free clinics are busy with the local treatment of these cases, as they constitute a very large number of the cases of tubal infection. It is this type of salpingitis that we find in the class of cases of the so-called "one-child sterility." When they are first married they are mildly infected by their spouse, promptly conceive, may escape a temperature reaction during the puerperium or not, depending upon the degree of immunity they have developed during the period of gestation. After the puerperium their recovery is masked, they keep complaining of pelvic pain, run a mild degree of fever, and may go on for years with this condition of subacute salpingitis. Not only do they suffer with an inflammatory process but they have a purulent salpingitis. How often does the surgeon open the abdomen in these cases, only to find pus in the tubes, often with a minimum degree of inflammatory reaction. Many of these women are up and about, nevertheless they are great sufferers and demand our earnest consideration.

In the early stages of the development of a salpingitis, before definite objective signs are obtained, unless we carefully study their history, we are apt to overlook these cases, and perhaps do them the injustice of classing them as neurotics, when in truth they are great sufferers and should have the relief surgery can offer them and not subject them to many years of invalidism and suffering. As time goes on, definite palpable signs develop in the pelvis. The tubes become distended with pus, they agglutinate with the ovaries, becoming tuboovarian abscesses. Sigmoid and loops of intestine become adherent, more or less solid masses develop in the pelvis, and the case becomes one that can be readily diagnosed. The proper diagnoses lead to the only sure method of cure that the present

stage of medical science can offer, namely: surgical ablation of the organs and the removal of tissues destroyed.

When medical science has developed to that stage of therapeutic stability, that it can have at its command the power to remove inflammatory infiltration from tissues anywhere in the body, then and only then shall we be able to cure these cases without ablation of certain generative organs. Until such a time poor suffering women will have to submit to the knife to cure them of these ailments.

Many of these patients, of course, never again conceive, remain barren, suffer from month to month, and year to year, until the infected tissues are ablated, or until Nature comes to their aid, by the evacuation of pus into some hollow viscus of the abdomen, such as the rectum, bladder, sigmoid, or loop of intestine. For a case of pyosalpingitis to end in this manner, of course, means untold suffering to the patient, and is not to be countenanced by an enlightened profession.

I make a plea here for an early diagnosis and for an early operation. The tissues are infected and function of child-bearing is destroyed. The function being gone, why allow these women to go on with useless suffering. Many of these women lead a life of invalidism, often they are not really very ill, but are never perfectly well. They complain of all sorts of pains. Many of them develop neuroses and they constitute a large proportion of the cases that finally lend themselves to all sorts of treatment by people outside of the pale of the medical profession. The watering places, the health resorts, the sanitariums all contain a quota of subacute pyosalpingitis cases. With each menstrual period their suffering is increased, some of them have to go to bed for one or two days of each month, while others with more stamina keep out of bed but eke out miserable days during each menstrual period. Their menstruation as a rule is disturbed, not only in the length of their periods but in the quality and quantity of the menstrual flow. Some of them have menorrhagia and metrorrhagia, their periods are prolonged over many days. Others again menstruate for a few days, stop for several days and then the flow begins again to continue sometimes for half a month. All degrees of disturbance are found with the menstrual function. These cases of chronic purulent salpingitis are in many ways very much similar to the individuals with chronic gastric ulcers. The latter have periods when they are fairly comfortable and then again periods of great disturbance with their digestion. So it is with these gynecological cases, they may remain well for many months at a time only

to have their suffering return. In this manner, they spend often years of suffering and invalidism. The patients are apt to be affected by conditions of the weather. They feel comparatively well during the balmy days and suffer as the weather conditions change. They are apt to be affected with pains in various parts of their muscular apparatus, indeed not infrequently one finds many groups of muscles affected with myositis, very much the same as in an individual suffering with rheumatism. Indeed these are really cases of rheumatic affections of the muscles and tendons. The etiology is almost the same as that of rheumatism and who knows but that they are real cases of rheumatic affection due to absorption of purulent material.

In many cases the suffering is entirely confined to the nervous system. Various groups of nerves such as the facial and supraorbital, the brachial plexus and the pelvic plexus are affected. I have seen several cases where the only evidence of a pelvic disease was that of a severe sciatica. The patient would suffer with these attacks of sciatica very severely. The usual remedies used for this malady proved unavailing until the source of the infection was removed and then a prompt recovery followed the operation.

It is not strange that these women do suffer with these various complaints referred to the muscular system, to the nervous system, or even to the gastro-intestinal tract, as well as pain and discomfort in the pelvic region, when we consider that they absorb septic material from day to day, from month to month, and year to year.

When these cases of pyosalpinx come to the operating table, we are in the habit of preserving as much ovarian tissue as possible in order to conserve the function of menstruation. Studying this phase of the question in recent years, I am not at all convinced that the preservation of this function is, after all, of such a great advantage to this class of patients. I have had opportunities to observe cases where the function of menstruation was preserved and cases where it was not. The cases that do not menstruate after operation it seemed to me, by escaping the periodic disturbance incident to menstruation, were very much better off. On the other hand, those operated cases who menstruate have been subjected to a great deal of suffering every month. Given a case where the ovaries are so greatly damaged by disease that the greater part of these organs have to be sacrificed, it is better for the patient to have the surgeon do a total ablation of all the organ if the patient's condition and technical difficulties will permit. If the uterus cannot be removed, then ablate the ovaries entirely so as to stop the menstrual function.

I shall cite but one case to illustrate this point. The patient, a young woman of twenty-two at the time of operation, married four years, gave birth to a child the first year of her married life. The following year she was infected by gonorrhea and for three years suffered with a subacute attack of purulent salpingitis. At the time of operation it was found that both tubes had to be ablated and both ovaries had to be resected. Her menstruation recurred after operation and after continuing for one year the periods entirely ceased. The cessation of menstruation was due to the fact that very little ovarian tissue was preserved at the time of the resection of the ovary. This imperative removal of most of the ovarian tissue at the time of operation seemed in the long run to have been of benefit to her. With each previous menstruation she suffered considerably and as soon as the menstrual function ceased, she improved wonderfully. By the removal of the periodic disturbance incident to menstruation her recovery was more prompt. It might be argued that in this particular case the original gonorrheal infection might have been a mild one and hence the complete recovery of the patient, but this in turn can be disproved by the fact that the infection in the urethra and bladder still existed for many years after the operation. While she suffered from this condition at times to a considerable extent, she was free of pelvic pain from which others suffer so much after operation when their menstruation is preserved. Early operation in these cases is advised, just as soon as the diagnosis is made, so as to anticipate the development of what might be called a neuromuscular syndrome.

The cases of recurrent attacks of acute pyosalpingitis constitute a class which will admit of a ready diagnosis at the bedside. As a rule these occur in patients somewhat advanced in years who have been more or less sterile during their married life, but who have been free of pelvic disease sometimes for many years. No source of infection can be demonstrated in this class of cases at the time of the attack. The attack of pyosalpingitis comes on as from a clear sky in the midst of perfect well being. They are taken down with acute pelvic peritonitis, with great prostration, almost as acute as in the acute cases of pyosalpingitis. The abdomen becomes distended, the temperature and pulse rises, the pain is, at times, very severe, and we seem to have before us a patient with a fulminating case of peritonitis. If we question these cases carefully we find a typical history. They have had attacks of acute pelvic infection many years ago, which in some cases, they have entirely forgotten, but questioning them on this point brings back to their mind the facts of earlier pelvic disease. They have remained sterile all through their married lives, they have had more or less disturbance with their menstrual function, but as a whole have been fairly well for many years. Pel-

vic examination reveals considerable disturbance in the uterine adnexa, usually unilateral. An illustrative case of this type of pyosalpingitis was in the case of Mrs. W., the history being as follows:

She was forty-seven years of age and still menstrually active. She was seized with a sudden attack of pain in her left side which was very severe, necessitating the administration of several hypodermics of morphine. The physician who saw her was unable to make a definite diagnosis because no source of pelvic infection was appreciable at the time of the attack. Abdominal examination showed extreme tenderness over the left lower quadrant of the abdomen. Bimanually a mass could be made out in the left side of the pelvis. The patient says that she has been perfectly well for many years, that she had not suffered with any pelvic disease, that she had been married twenty-three years and had never conceived. At the time of operation a typical tuboovarian abscess was discovered, which was removed and the pus cavity drained. The right tube was the seat of a chronic obliterative salpingitis. Later questioning of the patient disclosed a typical history of gonorrheal infection. Here was a case where the infection must have been lying dormant for many years, only to start up anew and give rise to an acute recurrent attack of pyosalpingitis. In these pus collections, as a rule, no microörganisms can be demonstrated. They are safe surgical risks.

In connection with this subject the question may be asked in what manner do these acute recurrent pyosalpingitis cases arise? There is no doubt that the question of immunity is an important factor. Is it not possible that in these cases the immunity that has developed during the first attack of inflammation has lasted for many years? Although the lurking infection was present it never showed itself by a reaction until the immunity, so to say, has dissipated itself, and when that has occurred the infection broke out again and gave rise to a new attack. This phase of immunity is but slightly understood. We are very well aware of the existence of an immunity but in what manner this acts and how long it lasts, how it keeps in abeyance the lurking infection in the system, are still matters that are very little understood.

*Etiology.*—The etiology of pyosalpingitis may be classed under two headings. First, those caused by gonorrheal infection and second those caused by pyogenic infection. Those belonging to the first class are by far the more numerous. It has been estimated by competent observers that 66 per cent. of all gynecological infections are due to the gonococcus. The gonococcus, we must admit, soon disappears from the field of infection but, so to speak, prepares the field for the succeeding pyogenic infection and for the

colon group of bacilli. The gonococcus as a rule infects the surface epithelium. The vulva and the glands that are located in the vulvar region are first involved or the cervix and the uterine mucosa may be the first seat of infection. From this region the Fallopian tubes become invaded and the infection then spreads to the pelvic peritoneum as well as to the ovaries. The other type as a rule starts either from a septic abortion or during a puerperal infection and spreads by the lymphatics and by infectious thrombi. There have been cases reported where the pelvic infection was supposed to be due to inflammation of the appendix, but this source of pelvic infection must be extremely rare. I have never seen a single authentic case of this kind of infection of the pelvic organs.

*Diagnosis.*—The diagnosis of these three types of pyosalpingitis is, as a rule, readily made. In acute pyosalpingitis we have the history of an acute infection either by the gonococcus or pyogenic germs, an acute onset and all the cardinal symptoms of an acute infective reaction. In the subacute cases we have the history of the infection at a remote date, we have a long period of suffering dotted here and there with subacute attacks. We have a train of symptoms indicative of a septic abortion. Upon these points we can base a clinical diagnosis. In the recurrent attacks of acute pyosalpingitis we have a history of sterility or a history of an acute pelvic onset of the disease, a long period of wellbeing and now a sharp attack of inflammatory reaction in the pelvis. The clinical value of making these differentiations is considerable because in the acute cases the line of treatment is very much different than in the subacute and the acute recurrent cases. While in all the three classes of cases surgical intervention is the proper mode of treatment, in the acute cases operation should be deferred for a reasonable length of time to insure the development of an immunity. In the acute attacks deferred operation gives a better prognosis, while in the subacute and in the acute recurrent cases immediate operation after the diagnosis has been made is a safe procedure. It is from this point of view that a differentiation between these different types of pyosalpingitis is of much clinical value.

At the Woman's Hospital it has been the policy for many years to treat these acute cases in the following manner: If a patient comes to our wards with an attack of acute pyosalpingitis, where the infection is of recent date, the patient is put to bed, an ice-cap is placed on the abdomen and the case is treated purely on symptomatic lines. Of late, instead of applying ice-bags we have been baking these cases with dry hot air, with considerable success. Should the

septic absorption be very severe, as indicated by sharp rises of temperature and chills, an attempt will be made to reach the focus of pus by the vagina. If this is not feasible, nothing further is done surgically. The nutrition of the patient is kept up as is consistent with the capabilities of the digestive function. The bowels are moved with enemata, the pain is relieved with anodynes, and as much fluid is given as can be taken by the patient. As these women always suffer from a certain degree of acidosis, this is combated by the proper administration of alkalies. The blood reaction to the inflammations is estimated frequently. The case is not hurried to the operating table until a reasonable time has elapsed, during which time we feel sure that a certain amount of immunity has developed. This is estimated by the fact that although the abdomen is still rigid and the pelvis filled with inflammatory reaction, the temperature has a tendency to reach the normal. The pulse has become more steady, the patient's suffering is less, sleep has returned and the patient looks as though she was steadily improving. When this stage has been reached there is greater safety in operation than during the acute onset of the disease.

Our mode of treatment, however, with the subacute cases of pyosalpingitis and the acute recurrent cases is entirely different, here operation is deferred to a less degree and we are reasonably sure in these cases that the prognosis is good. As a rule the patients stand operation well and their recovery is prompt.

The question, what to remove in these cases at the time of operation, is one that has not been settled. Shall the infected focus be excised alone or shall the uterus, tubes and ovaries be removed in all of these cases?

It is of interest, therefore, to note here the kind of operations that were performed on the 100 cases included in this report. In 62 per cent. both Fallopian tubes were ablated. In 15 per cent. only one tube was removed. In 18 per cent. the uterus, both tubes and ovaries were removed. In 43 per cent. one ovary was removed at the time of the operation for pyosalpinx. Both ovaries were removed in 18 per cent. of the cases. The appendix was removed in 28 per cent. In 8 per cent. one or more plastic operations were also performed, such as trachelorrhaphy and perineorrhaphy. Three times the round ligaments were shortened at the time of the operation. In only 5 per cent. of the cases was vaginal section done when pyosalpingitis was diagnosed. In 26 per cent. of the cases the uterus was curetted at the same time. In 2 per cent. a myomectomy was performed.

The question may be asked, why was there no hysterectomy performed in the 18 per cent. of cases where it was necessary to remove both ovaries?  The answer to this question is found in the fact that a hysterectomy means an added risk.  It requires unusual surgical judgment to decide what to do and what to leave undone, in many of these cases of pyosalpingitis.  It is freely admitted that in pyosalpingitis where both ovaries have to be sacrificed, the removal of the uterus is advisable, as in all of these cases the uterus itself is infected and its ablation will prove of advantage to the patient.  However, the surgeon who makes it a rule to remove the uterus in every case where both ovaries have to be removed, will find his operative mortality rise.  There can be no hard and fast rule established regarding this point in the operation.  The surgeon must exercise his best judgment in each instance.  In many cases the technical difficulties of the operation are such that the uterus is better left untouched, while in others the condition of the patient may call for a short operation with the least possible amount of traumatism.

Death occurred in one case thirty-six hours after operation, from profound sepsis.  The patient was thirty-nine years old, and had a large tuboovarian abscess.  A double salpingo-oöphorectomy and appendectomy was performed.  The case was serious from the start.  Every time her temperature was taken it was found higher and it finally reached 106° F.  She apparently died of peritonitis.  No autopsy was permitted.  This gives us a mortality of 1 per cent.

It is noted that in 28 per cent. of cases the appendix was also removed.  It may be asked, is this a good practice?  This question can be answered in the affirmative.  If the appendix is diseased it should, of course, be removed.  If it is not diseased but appears abnormal, it should be removed, in the type of cases designated in this paper as subacute salpingitis or acute recurrent salpingitis.  But in the acute salpingitis cases unless the appendix is diseased, it is better not to remove it as it is not advisable to open up new avenues for infection.  An undamaged peritoneum can cope with infection more successfully than a traumatized one.  In the large majority of cases of pyosalpingitis the pus is sterile and therefore the removal of the appendix is not attended with any danger, but in the acute cases the pus may be quite active with germ life and the risk of spreading the infection is great.

*Résumé of Operations.*

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|---|---|
| Removal of uterus, both tubes and ovaries............ | 18 cases |
| Removal of both tubes........................... | 62 cases |
| Removal of one tube............................ | 15 cases |
| Vaginal section for pus......................... | 5 cases |
| Total................................... | 100 |
| One ovary removed............................. | 43 cases |
| Both ovaries removed........................... | 18 cases |
| Appendix removed.............................. | 28 cases |
| Ventrosuspension.............................. | 19 cases |
| Plastic on cer. and per........................ | 8 cases |
| Short. rd. ligaments.......................... | 3 cases |
| Divulsion and curettage........................ | 26 cases |
| Myomectomy................................... | 2 cases |
| Hemorrhoids.................................. | 1 case |

The round ligaments were shortened three times and myomectomy was done twice; this means that five intraperitoneal operations were done of a plastic nature in the series of 100 cases. While it is perfectly safe to do this in the majority of instances, in the acute cases one should confine himself to the removal of the diseased organ and traumatize the peritoneum as little as possible. It is, however, good practice to suspend the fundus from the abdominal wall where there is a tendency to retroversion of the uterus, as this operation traumatizes the peritoneum to a very slight degree. By preventing the uterus from becoming adherent in an abnormal position much suffering to the patient will be avoided.

Plastic operations on the cervix and perineum were done only in eight cases. This is not because the operation is not safe, but because the largest number of these cases have no lacerations to repair. By the very nature of the disease they are sterile. This much, however, may be said in connection with this phase of the subject, that plastic operations require time for their performance, and the time factor is of importance. One should not start plastic operations without first giving the matter due consideration, as one does not know before the abdomen is opened just how much work has to be done and how much time will have to be spent on the operation. It is perhaps better to open the abdomen first, finish the intraabdominal work and then, if the patient's condition permits, sew up the lacerations of the perineum. There is still another reason why it is better practice to do the intraabdominal work first, namely, should it be necessary to introduce drainage by the vagina, the

newly sutured wound of the perineum will be exposed to infection from the purulent material that has to drain over it.

With reference to drainage, the statistics show the following.   In fifty cases no drainage was found necessary.   In forty-three cases the pelvis was drained by the vagina and in six cases by the abdomen. In one case the pelvis was drained both by the vagina and abdomen. Experience at our institution has shown that abdominal drainage is not as objectionable as has been thought to be in former years. We find that hernia is not common after abdominal drainage. In fact, in proportion it is less common after drainage from above than in those cases where drainage was instituted from below.   The reason for this is the fact that when drainage is instituted above, less cases of breaking down of the abdominal incision occur, than when the drainage is introduced from below.   The breaking down of the abdominal incision means subsequent hernias.   In the forty-three cases drained from below, the abdominal incision broke down in six cases, which means six hernias, or 14 per cent.   In the six cases of drainage from above the incision healed in every case, hence no hernia.   The reason why hernias develop less frequently now than formerly is that the abdominal incision is secured by a better suture technic than in former years.   By suturing the various layers of the abdominal wall separately, better union will occur and less liability to breaking down than was the case in former times.   To these details of the closure of the abdominal wound we are indebted for better result.   When drainage is instituted from below by way of the vagina, many of these infected foci in the pelvis cannot be drained from below, the result is that the infected material consisting of blood, fibrin, pus and broken down tissue accumulates and finally reached the abdominal incision, through which it breaks and thus favors the formation of postoperative hernia.   At the Woman's Hospital we do not hesitate to drain from above when the foci of infection are so situated that they can be more readily drained from the upper route nor is it necessary to make counter drains.   There has also been an improvement in the method of draining.   We find that a rubber drain is superior to a simple gauze drain, but the drainage should not be done by rubber tubing but by rubber tissue in which gauze has been wrapped.   Indeed gauze drainage is only used when bleeding has to be stopped and where large raw areas of bleeding surface must be controlled by pressure, the insertion of gauze is imperative.

*Recovery from the Operation.*—In 85 per cent. of the cases the recovery was "smooth."   By this is meant that there was but a

moderate rise of temperature and pulse after operation, that there were no complications such as hemorrhage and shock, that the patient did not suffer unduly, that there was but little or moderate distention of the abdomen, that the bowels moved with enemata or mild cathartics, and that the incision healed satisfactorily.

In 15 per cent. of cases the recovery was "stormy." In these cases there was more or less shock after the operation. The temperature and pulse rise was considerable, the distention of the abdomen more or less marked and the suffering in some cases quite intense. Anodynes and stimulants had to be used freely, which further complicates the condition. These cases require saline infusions, stomach lavages and a good deal of nursing. Their convalescence is retarded and some of them come out from under the operation, considerably wrecked. It is, however, interesting to note how complete is the recovery of these very sick cases, when the focus of infection is removed.

The statistics show that these cases remained at the hospital for a comparatively short time, as follows:

| | | |
|---|---|---|
| 1 case | | 10 days |
| 22 cases less than | | 20 days |
| 25 cases less than | | 25 days |
| 25 cases less than | | 30 days |
| 12 cases less than | | 35 days |
| 9 cases less than | | 40 days |
| 5 cases less than | | 50 days |
| 1 case | | 103 days |

Total, 100

The number of days that the patients remain at the hospital is practically determined by the incision in the abdomen. If the incision heals by primary union the patient's stay in the hospital is limited. Suppuration means delay all around, delay in healing and delay in the hospital, as well as delay in the final recovery. One case left the hospital in ten days. This is unusual, but it shows how fast an incision can heal and how quickly patients can recover. One case remained in the hospital 103 days. In this case the abdominal wound broke down and she also had a complicating crural phlebitis. Nothing retards recovery so much as a phlebitis. The patient is practically well but absolutely helpless, and there is nothing to do with ward cases particularly, but to keep them at the hospital.

In conclusion, I may say that the study of these cases shows that

the operations for pyosalpingitis are safe, the mortality is very low, the largest number of cases occur in the early decades of life, that in 50 per cent. of cases no drainage need be used, that in 85 per cent. there is a smooth recovery from the operation, that the patient can leave the hospital on an average of two and a half weeks after operation.

# SURGICAL RECORD SYSTEM OF THE WOMAN'S HOSPITAL.

BY

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THE value of the surgical and medical records of a hospital is in proportion to the thoroughness and accuracy with which they are compiled, not only for each individual patient, but in the painstaking bringing together of similar groups of diseases and treatments under their various heads.

It is only in this manner that the enormous material passing through the hospitals of the country can be made of value to the student of medicine, to the profession at large and to the patient in the future.

The patient as he or she enters the hospital should not be solely in the light of the recipient of our care, but also as one from whom something is to be learned, if not through the unusual condition found, certainly by associating the disease, the treatment and the result with those of a similar nature; and by the compilation of the cases to draw positive conclusions of value to the profession in general.

Unless every detail of the findings of the condition of the patient, of the treatment given and of the recovery is carefully noted in the records, the individual history is of little value for future reference. As an individual record no matter how carefully made, its scientific value is little, unless associated with and studied as one of a group of many of a similar character.   It is here that the persistent care in filing becomes of so much importance.

It matters not what system is adopted, whether filing according to diseases or by hospital numbers with an added index of diseases, so long as the two essentials of a working system are fulfilled, that of

being able to refer to an individual history without loss of time, and that of being able at all times to study collectively diseases of similar groups with their treatment and their recovery.

The histories of the Woman's Hospital, until ten years ago, were no better than those of the average hospital, nor were they any worse. The method in use at this period was that of making a full record of each patient during her stay in the hospital and filing such records according to the entrance number of the patient.

The description of the operations were written up by the House Surgeon after his day's work, or as soon as possible thereafter. The pathological reports on specimens sent to the pathologist were properly filed, yet all specimens were not examined.

This was the method in vogue during the past decade. They were in the majority of instances as good records as those made in hospitals in general. From the standpoint, however, of lessons to be drawn from their study, they are practically valueless, in that it would be a hopeless task to attempt the study of large groups of similar operations. To make them of service for such a purpose the entire collection from the organization of the Hospital in 1856 would have to be examined and cross-indexed.

This method, which is to an extent in vogue in the large majority of the hospitals, admits of many inaccuracies. It is more than we can expect of a House Surgeon to obtain from him an accurate description of the findings at the time of operation and the method followed, especially if the field of work is in good view only to the operator.

Nor can we hope to maintain useful records so long as the responsibility is thrown on the House Staff, whose duty is primarily the care of the patients and whose interest in the written records is at a minimum.

This is the reason for the failure in most hospitals in the matter of histories. These young men spend only a limited period in the hospital, their primary duty is the care of patients, any additional work in history making does not appeal to them nor will it be well done.

The keeping of the detailed records of the diseases and treatment of the patients of a hospital for the care of whom the institution is being maintained, too often receives no consideration and is left to be cared for by the transient house staff, under the direction of the attending staff, who give but scanty thought to the subject. Under such circumstances we have no one to blame for the poor results but ourselves.

The governing board of a hospital is usually made up of business men who recognize the importance of providing for the accurate accounting of the economic and financial side of the institution. The medical and surgical matters are sealed books to them and they must of necessity place the whole responsibility for such upon their attending medical board. When the necessity of a specified course is laid before them it is as a rule gladly adopted, especially so when the importance of such a course is clearly explained to them.

This has been our experience at the Woman's Hospital and as a result the present system of maintaining the surgical records of the institution has been devised. The underlying basis of this system is the same as in a few other large hospitals, that of recognizing that a continued efficient work must be carried out by paid clerks, whose sole responsibility is that of the work before them. And furthermore where there is a large surgical board, as in our instance, the supervision of this work should be assigned to one of its members, aided by a younger assistant.

It is only by this method of fixing the responsibility that permanent and satisfactory results can be obtained. Toward this end, three stenographer historians are employed by the hospital, of whom one is responsible for the entire work of the department.

The duties of these stenographers are:

1. Receiving the dictation and transcribing the findings and various steps of each operation as given by the operator at the close of each operation.

2. Typewriting the histories of each new patient as furnished by the member of the house staff, whose duty it is to take histories.

3. Receiving the dictation and transcribing the pathological reports as given by the pathologist.

4. Making up the index cards for diagnosis and operation of all patients who have been discharged from the hospital and filing the same.

5. To be responsible for the proper filing and care of all surgical histories of the hospital.

6. Conducting all the details of the "Follow-up System" as introduced in the hospital for ward patients.

The "Follow-up" consists of

1. Making a short abstract of each discharged patient on the abstract card as furnished.

2. Making out and filing the "Return Card" for each patient.

3. Taking the dictation of the examiner and transcribing the results of all examinations of returned patients.

4. Notifying each patient at least a week or ten days ahead of her specified time for return, that she is expected to come back to the hospital for examination.

To amplify the above, that they may be the more clearly understood, let us take up the matter of the description of the findings and steps of operations. The old custom was that such accounts were to be written up by the House Surgeon, who acted as the first assistant to the operator. This method has many well-recognized weaknesses and gives rise to frequent erroneous statements, vitiating the value of the history for further study.

The method of requiring the operator to write up his own accounts or of dictating his findings and technic at a later time, while giving more accurate histories, is still open to serious criticism on account of the frequent interruptions and the press of engagements of the surgeon. This method is in use at one of our largest teaching hospitals and it is amusing to see the daily posting of surgeon's names as neglecting to give the time to dictate certain operations of the day previous.

The custom in vogue at the Woman's Hospital is that such dictations shall be given by the operator before he leaves the operating room, in fact it is usually given while the surgeon is closing the wound. The stenographer is notified toward the close of the operation. She comes at once to the operating room and signifies her presence by saying "stenographer." The surgeon can then dictate while he is finishing his work without interfering with the routine of the clinic.

The history as given by the patient on her admission to the ward is taken by one of the resident staff. As a guide for his questions a printed outline is attached to each sheet. This history as taken is turned into the history room, where it is typewritten and placed upon the individual chart within twenty-four hours after the patient's entrance.

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<div align="center">No. 1</div>

<div align="center">**HISTORY**</div>

Name.......................................No......Surgeon..........

Address........................................Rec. By..........

Age......Nativity......M.S.W......Admitted..........Occupation.......

Relative or friend...................................................

Physician...........................................................

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<div align="center">**Outline to be Followed**</div>

---

Chief Complaints.....................................................

.....................................................................

Family History.......................................................

.....................................................................

Deaths—cancer, tuberculosis, syphilis.  Nervous affections.  Health of living members.

Previous History...................................................................
...................................................................

1. Menstrual—age at onset, duration, scant, moderate, profuse.  No. of napkins daily (stained or saturated), regular or irregular, interval, pain, last period.

2. Marital—how long married, No. of children, ages, nature of deliveries, lacerations, repair, puerperia.  Abortions or miscarriages—No., last, induced or not, infection.  Venereal diseases.  Husband's occupation.

3. Illnesses.—Circulatory, respiratory or renal symptoms, injuries, operations.

Present Symptoms...................................................................
...................................................................

1. Menstruation—how changed.  Pain—when, character, duration, location. Menorrhagia, metrorrhagia.

2. Vaginal discharge—quantity, color, consistency, odor, time of.

3. Nervous and mental.  Pain—character, location, constant, occasional, associated with.  Backache—location, constant, occasional, associated with. Headache—location, constant, occasional, associated with.  Intermenstrual pain.  Bearing down or distress in pelvis.  Dragging sensation or distress in flanks.  Position of comfort when reclining—back, right side, left side.  Position of discomfort when reclining, why?  Nervousness—character of Flashes. Irritability.  Easily tired by exercise.  Insomnia—refreshed or not by sleep. Emotional control.

4. Gastrointestinal—appetite, digestion, gas, relation of gastric distress and pain to meals, nausea, vomiting—time of, character of vomitus.  Jaundice, clay-colored stools.  Bowels—control of, constipation, diarrhea, pain, blood, mucus.

5. Urinary—painful or frequent micturition, day, night, blood, control, retention.

6. Abdominal swelling or tenderness.

7. Vaginal protrusion, when?

8. Fever, chills.

9. General condition—loss of strength, weight—maximum, present.

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The index cards for diagnosis and operation (Nos. 2 and 3), are made out by the stenographer historians under the instruction of a junior member of the attending staff.  The "International Nomenclature" is the one in use with some minor additions.  The operations

| | No. 2 | | Condition upon Discharge | | | |
|---|---|---|---|---|---|---|
| Hist. No. | **DIAGNOSIS**   Dr. | | | | | |
| NAME ........... | Operator................................ | C | I | UI | D | |
| Laceration of Cervix............................. | | ∦ | | | | |
| **Myoma Uteri**...................... | | ∦ | | | | |
| Cervical Polyp............................. | | ∦ | | | | |

on the majority of patients are usually multiple. In order to make the proper filings of each operation and at the same time to show its relation to the several other operations on the patient, the complete

| No. 3 | | | | | |
|---|---|---|---|---|---|
| Hist. No. | OPERATION | Dr. | Suc's | Par'l Suc's | Fail'r |
| Date | Operator_____ | | | | |
| D. & C............................... | | | | | |
| Trachelorrhaphy............................... | | | | | |
| Perineorrhaphy............................... | | | | | |
| Myomectomy............................... | | | | | |
| Appendectomy............................... | | | | | |

list is tabulated on as many cards as there are operations. On each card one of the operations is typed in rotation in red. The filing of the card is as the red typing indicates. The same system is followed in instances of multiple pathological states on the diagnosis card.

It is impossible to get a large staff of operators to use the same terminology in diagnosis or operations. The terminology of the surgeon is, therefore, accepted as given and subsequently changed to that of the "International Nomenclature" in use. There is little difficulty in doing this; it is a matter of training of the stenographers and some counsel when at times they are in doubt.

At a specified daily hour a stenographer is sent to the pathological laboratory to type the dictation of the pathologist, on the macroscopic and microscopic work of the day.

The complete physical examination is made on a sheet for the purpose, as are also all other scientific and laboratory studies, and reports from the x-ray department, the cystoscopic department, etc.

The history of the patient as now completed with the attached bed-side notes of the detail of her treatment, together with her temperature and pulse record, is sent to the record room on the discharge of the patient from the hospital.

It is now the duty of the junior attending surgeon of each division to go over such histories within a few days to see that no errors appear.

After receiving his signature, the stenographers make a cross-index of all operations done and of the diagnosis made of pathological conditions present, by following the method previously described of filing multiple conditions and operations under their various and separate heads.

## THE "FOLLOW-UP SYSTEM."

To keep in touch with the patients after they leave the hospital requires something more than the giving of a card of reminder and a request that they shall return at a specified time for reëxamination. The personal element enters largely into the success of this effort. When this system was first inaugurated in the hospital, the return card was given by one of the nurses of the ward, who was expected to explain to the patient the object of her returning. The nursing force of every ward, as in all training schools is constantly shifting and it is a question as to whether all of them entered closely into the spirit of the return of patients for examination. The necessity of some responsible person for this purpose being evident, the matter was presented to the Board of Governors, who authorized the assignment of one nurse from the social service department for this purpose.

The duties of the nurse thus assigned is to make daily visits to the wards, to explain fully to each outgoing patient the object of her returning and the patient is given by her the 'return card' as here shown. The personality and interest of the nurse assigned to this duty enters greatly into the number of returns. The nurse in question also visits all patients at their homes who after a second notice fail to return. As a result of looking up such patients the social service, reports for six months, 245 patients found, of whom 208 returned and six had died, only thirty-one would not give the time to return.

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No. 4

DISCHARGE CARD

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### KEEP THIS CARD

Hospital No._____ Surgeon_____
Name_____
Address_____
Date of Discharge_____
Return to Hospital for examination at 10 o'clock_____

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The utilization of the services of the social service department of the hospital in our "Follow-up System" is of greatest value not only in having the service of one of their nurses assigned for this purpose, but also in looking after the convalescent and needy patients, the purpose for which this department was organized. For the

No. 5

**RETURN CARD**

Date of Operation_____Discharged_____

To Return for Examination_____

_____

_____

Name_____

Address_____

Friends Name_____

Address_____

Referred by_____

Address_____

          Surgeon_____

purpose of the records of the "Follow-up System" a return card is made out for each ward patient and filed under a date ten days previous to that on which she is told to return. Each morning notices are sent to all patients whose return cards are on file under this date. The notice is as follows:

No. 6

**WOMAN'S HOSPITAL**
IN THE STATE OF NEW YORK
110TH STREET
BETWEEN AMSTERDAM AND COLUMBUS AVENUES

New York_____191___

_____

_____

Dear_____

    You are requested to return to the Hospital at 10 o'clock in the morning, on or about_____for the purpose of examination, in order that we may know the result of your operation and treatment.

    You may need advice, and by returning as we direct, you will not only be doing something for yourself but possibly for others.

            **Bring your card with you.**

                          Very truly yours,

    If the patient does not respond within two weeks a second notice is sent out. If this is not answered the patient's name and address as also that of the friend are given to the social service for the purpose of tracing, with the results I have given above.

We have found that for our purposes it is better that the histories be bound in serial numbers of fifty histories to the volume. It is necessary, therefore, that an abstract card be made out from the history of each patient for the purpose of the "Follow-up System." These cards are 9½ by 7½ inches. On the back of this abstract card is typed the findings on each subsequent visit of the end results of the operations done (No. 7).

---

No. 7

Name...................................................Hospital No...........

Address................Referred by..............Admitted...............
S. M. W...............Address.................Discharged..............
Age..................Friend...................Operator................
Chief Complaint........Address.................Anes ..................
Preop. Diagnosis.......................................................
Postop. Diagnosis......................................................
Path. Diagnosis........................................................
Operation..............................................................
Impor. Points..........................................................

Convalescence..........................................................

---

These cards are filed in alphabetical order.

There are positive labor disadvantages in making out these abstract cards. In many ways it would be better to add the end results to the surgical history by the insertion of an extra sheet. This is done in some hospitals, notably the Presbyterian. There are, however, some disadvantages in this, and after viewing the matter from various angles it was thought better from the standpoint of collective study and in the end to be more economical, to follow the plan we have adopted.

The "Follow-up System" has upon its files for the past year 1280 ward patients. Of these 240 had given wrong addresses, as also incorrect addresses of their friends. We have records of the returns and end results of 880 of the patients, or about 87 per cent., which is very satisfactory. The reëxamination of patients takes place each morning at a definite hour with the exceptions of Sunday. If the result is not satisfactory the operator is notified by letter, the name and address of the patient being given, that he may have her seen and sent back to the hospital if he thinks it best (No. 8).

No. 8

**WOMAN'S HOSPITAL**

IN THE STATE OF NEW YORK

110TH STREET

BETWEEN AMSTERDAM AND COLUMBUS AVENUES

_____191___

My Dear Doctor:

The present condition of_____

_____at (Address)_____

does not appear to the examiner to be all that you may wish (surgically, symptomatically)...............................

The patient has been instructed to call upon you at your office.

This notice is sent that you may communicate with her if you desire.

Date of Operation_____

Character of_____

_____

Remarks:

_____

The method of keeping our surgical records as described above we are fully aware is by no means perfect, nor am I aware of any system that is in every detail ideal. The method best suiting our hospital may not be at all practical in another, as for instance in a general hospital a patient in the large majority of cases enters its wards for one condition and all other concurrent troubles are complications and are to be classed as such. With gynecological hospitals such as the Woman's the majority of our patients have multiple conditions no one of which can be classed as the major disease. Evidently the method of filing the records of the general hospital with its single diagnosis and complications is not applicable to the gynecological service with multiple diagnosis.

Our present method though not thoroughly satisfactory in every detail even to ourselves gives us an easily accessible large collection of accurate data on all the phases in our specialty. The files in the record room are for the common use of all the surgical staff of the hospital and each member is urged to utilize them freely for his own study and for the purpose of papers he may be preparing.

# DAILY CLINICS.

BY

DR. E. W. BULLARD.

Adjunct Assistant Surgeon, Woman's Hospital.

THE Outdoor Department of the Woman's Hospital is composed of five distinct organizations. These are:

1. The Gynecologic Clinic.
2. The Clinic of the "Follow Up System."
3. The Obstetric Clinic.
4. The Cystoscopic Clinic.
5. The Electro-therapeutic and X-ray Clinic.

I will confine this brief article to a consideration of the gynecologic service only.

Each of the five attending surgeons of the hospital, has attached to his service an out-patient clinic of two sessions a week, presided over by a chief of clinic with one or two assistants. There is a sixth out-patient gynecologic clinic in no wise differing from its fellows except that its operative cases are assigned in rotation to the services of the attending surgeons.

During the past year, out-patients have made us 9552 visits. Out of this number there were 3094 new patients, and 935 women were referred to the wards for operations or observations. In reducing these totals, it may be seen that at each of the two daily sessions an average of sixteen patients attend, five of whom are new. A detailed study of the attendance shows that the number of new patients is steadily increasing.

A woman desiring treatment, presents herself to the registrar in the waiting room any day, Sundays and holidays excepted, between 9.00 and 10.00 A. M. or between 2.00 and 3.00 P. M. The registrar makes a brief record of her financial and social status and decides as to whether she is worthy of free treatment. The woman, if acceptable, is then sent to one of the physicians who takes her medical history. She is next conducted by a nurse to one of the four individual dressing rooms and later put on an examining table. Each table is isolated from the rest of the room by curtains suspended from overhead rods, it foots to a large glazed window and a treatment table stands close by. After the patient's examination and treatment she returns

for advice or medicine to the physicians' desks in the consulting room. If a laboratory test is ordered a nurse immediately accompanies the patient to the pathological department.

Considerable medical gynecology is practised in the outdoor department.

Under appropriate therapeutics many cases of salpingitis in all stages are so much improved as not to need operation. The excellent results that can be obtained in some of the apparently severe cases by time, better home hygiene and persistent medical gynecologic measures are most surprising and gratifying.

Many mobile retroversions and not a few apparently adherent uteri, are manually replaced, and by the use of pessaries (often only temporarily) are relieved of symptoms or cured. A similar group of patients are those suffering from prolapse or actual procidentia who for various reasons, advanced age, severe cardio renal disease, fear or what not, will not be operated upon. It is frequently possible, by the use of a well-fitted pessary, ball, disc, ring, menge or other type, to give these women a large measure of comfort.

Much attention is paid to cases of ptoses and a good deal of instruction given patients concerning proper corseting.

Most ward cases are referred, at the time of their discharge from the hospital, to the clinic for postoperative treatment and supervision. It is well known that nearly every patient needs this especially after pelvic surgery. Postoperative adnexal indurations yield promptly to treatment, but without it many patients will remain as miserable as before their operations. Advice must be given as to the routine of daily life, the amount of exercise needed, douches, laxatives, tonics, diet, etc., etc.

Experimentation in drug therapy is in progress in the outdoor department. At present various studies in the actions of drugs are being carried on. In the observations of the action of lutein, some conclusions were reached after several years, as to its value in ovarian insufficiency. Problems of dosage, etc., in natural and surgical menopause, delayed puberty and amenorrheas were worked out, as were also contraindications of its use.

It may be of interest to note that comparatively little acute gonorrhea is found among those women coming to us for treatment, and even less frequently do we see the lesions of syphilis.
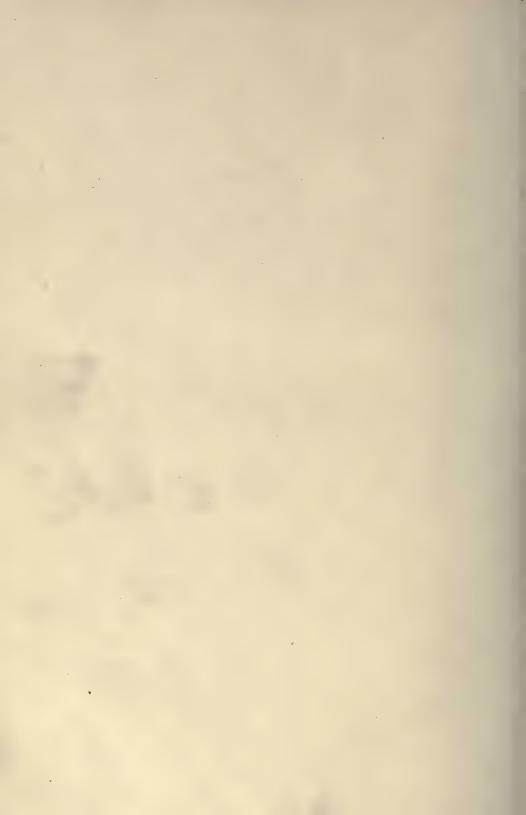
The pathological department utilizes the clinic from time to time in carrying on research.

All the departments of the hospital coöperate freely with the gynecologic clinics, many cases being referred for assistance in

diagnosis or treatment to the cystoscopic, the radiographic, the electrotherapeutic clinics or to the pathologic laboratory.

Not infrequently the help of other hospitals is asked such as in the cases of orthopedic backaches, pelvic neuroses, and gastroenteric troubles.
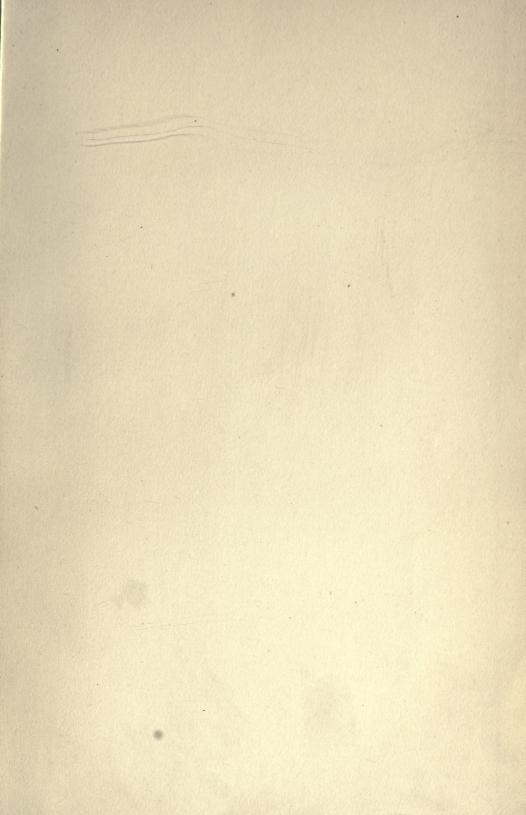
A great factor in the success of our treatment is the activity of the social service department. It sends its nurses into the homes of our patients and by supervision, advice and the expenditure of its money, adds much to the efficiency of the home treatment.
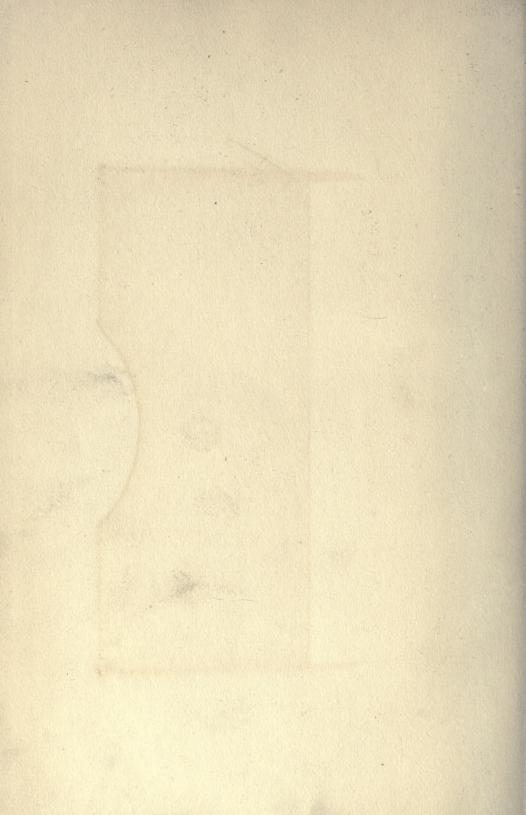
The medical records of the outdoor department are usually kept on a standard history form and are cross-indexed to facilitate the collection of material for study and for the writing of monographs.

147429

P
Med    Woman's Hospital in the State of New York
W      Report on the scientific work... 1, 1918.

NAME OF BORROWER.

DATE.